STIC Search Report
EIC 1700

STIC Database Tracking Number: 216293

TO:	From:
Michael Bernshteyn Location: REM 10A34 Art Unit : 1713 February 28, 2007 Case Serial Number: 10/508748	Mei Huang Location: EIC 1700 REMSEN 4B28 Phone: 571/272-3952 Mei.huang@uspto.gov

Search Notes

Examiner Bernshteyn,

Please feel free to contact me if you have any questions or if you would like to refine the search query,

Thank you for using STIC services!

Mei Huang

#2

Access DB# 216293

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Michael Kornbluth, Examiner #: 81515 Date: 02/22/07
Art Unit: 1713 Phone Number 30 272-2411 Serial Number: 10/508,748
Mail Box and Bldg/Room Location: Rem. 10A24 Results Format Preferred (circle): (PAPER) DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Innovative method for the preparation of proton conducting

Inventors (please provide full names): Gulio Alberti, Mario Casciola, Monica Pica

Earliest Priority Filing Date: 02/22/2002

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please, try to find the compound according claim 1 with the limitations of claims 2-8 and 13-14.

Thank you
M. Kor

SCIENTIFIC REFERENCE BR
Sci & Tech Inf - Ctr
FEB 23 RECD
Pat. & T.M Office

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STAFF USE ONLY

Searcher: MQH
Searcher Phone #:
Searcher Location:
Date Searcher Picked Up:
Date Completed: 2/28/07
Searcher Prep & Review Time:
Clerical Prep Time:
Online Time:

Type of Search

NA Sequence (#)
AA Sequence (#)
Structure (#) 4
Bibliographic
Litigation
Fulltext
Patent Family
Other

Vendors and cost where applicable

STN ✓
Dialog
Questel/Orbit
Dr.Link
Lexis/Nexis
Sequence Systems
WWW/Internet
Other (specify)

PTO-1590 (8-01)

Patent claims

1. Organic solutions containing metal(IV) salts and oxoacids of phosphorus from which, after evaporation of the solvent, insoluble compounds of general composition $M(IV)(O_3P\text{-}G)_{2-n}(O_3P\text{–}R^1\text{–}X)_n$ can be obtained, where M(IV) is a tetravalent metal, –G is a generic inorganic or organic group, $–R^1–$ is an organic group, –X is an acid group and n is a coefficient ranging from 0 to 1.5.

2. Organic solutions of claim 1 wherein the anion of the tetravalent metal salt is preferably chosen among carboxylates, chlorides and alkoxides.

3. Organic solutions of claim 1 or 2 wherein the tetravalent metal salt is preferably chosen between Zr, Ti, Sn and Ce or their mixture.

4. Organic solutions of any of claims 1-3 wherein the tetravalent salt is preferably the zirconyl propionate or chloride. 13522-92-8 84057-80-7

5. Organic solutions of any of the preceding claims wherein the group –G is preferably chosen among the acid groups –OH ; $–R^2\text{-}SO_3H$ and $–R^2–PO_3H_2$, where $–R^2–$ is an organic group with preferably linear chain such as $–(CH_2)_m–$ and $–(CF_2)_m–$.

6. Organic solutions of any of the preceding claims wherein the group $–R^1–$ is an arylen group chosen preferably among $–C_6H_4–$; $–C_6H_4–CH_2–$ and $–C_6H_4–CF_2–$.

7. Organic solutions of any of the preceding claims wherein the acid group –X is chosen between $–SO_3H$, $–PO_3H_2$ and –COOH.

8. Organic solutions of any of the preceding claims wherein the organic solvent is chosen among the protonable solvents, especially N,N-dimethylformamide, N-methyl–2–pyrrolidone, dioxane, dimethylsulfoxide, acetamide, acetonitrile, various alkanols and/or their mixtures, commonly used for dissolving the proton conducting ionomers of the state of art.

9. Use of the organic solutions of any of the preceding claims for the insertion of nano-particles of tetravalent metal salts, preferably phosphate-phosphonates, within the pores of polymeric or inorganic porous membranes.

10. A method for the filling of porous membranes of claim 9 with tetravalent metal salts, especially phosphate-phosphonates, based on the following steps:

a) preparation of the organic solution of claims 1-8 which, at the same time, may also contain a polymer and/or an ionomer of the state of the art;
b) impregnation of the porous membrane with such a solution;
c) elimination of the solvent;
d) repetition of the steps b and c until the wished percentage of pore filling is obtained.

11. Proton conducting composite membranes made of polymeric or inorganic porous membranes with pores filled with tetravalent metal salts, especially phosphate-phosphonates, or mixtures of said compounds with a proton conducting ionomer and especially prepared by using the solutions of claims 1-8.

12. Proton conducting composite membranes of claim 11 wherein the polymeric porous membrane is preferably chosen between those made of chemically and/or thermally stable polymers, especially

polytetrafluoroethylene (PTFE), polyvinylidene fluoride (PVDF), polyesters, polyethersulfones and fluoroelastomeres.

13. Proton conducting composite membranes of any of claims 11 or 12 wherein the pore dimensions of the porous membranes are preferably in the range 0.02-20 μm, especially 0,1-10 μm, preferably 0,4-2 μm and the porosity >10 %, especially >50 %, preferably 65-90 %.

14. Proton conducting composite membranes of any of claims 11-13 wherein the tetravalent metal salts, preferably phosphate-phosphonates, for the filling of pores are chosen between $Zr(O_3P\text{-}CH_2\text{-}PO_3H_2)_2$ and compounds of the series $Zr(O_3P\text{-}OH)_{2-n}(O_3P\text{-}C_6H_4\text{-}SO_3H)_n$, and $Zr(O_3P\text{-}C_6H_4\text{-}SO_3H)_{2-n}(O_3P\text{-}CH_2\text{-}PO_3H_2)_n$, with n in the range 0.1-1.5.

15. Composite membranes made up of a porous ceramic membrane partially filled with a tetravalent metal salt, preferably phosphate-phosphonate, according to one of claims 1-7 exhibiting catalytic activity.

16. Composite membranes of claim 15 wherein the tetravalent metal salts, preferably phosphate-phosphonate, with catalytic activity is chosen among those reported in claim 14.

17. Use of the organic solutions of any of claims 1-8 for the preparation of nano-polymers constituted by nano-particles of tetravalent metal salts, preferably phosphate-phosphonates, dispersed in the matrix of organic or inorganic polymers soluble in the same solvents.

STIC Search Results Feedback Form

EIC17000

Questions about the scope or the results of the search? Contact *the EIC searcher or contact:*

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

- *I am an examiner in Workgroup:* ☐ *Example: 1713*
- *Relevant prior art* ***found****, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
  (journal articles, conference proceedings, new product announcements etc.)

- *Relevant prior art* ***not found:***
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28

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=> fil reg
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                ACT BER748AU/A
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L1           22 SEA (24937-79-9/BI OR 608103-65-7/BI OR 116405-42-6/BI

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L2                STR
L3                STR

     FILE 'REGISTRY' ENTERED AT 10:07:05 ON 28 FEB 2007
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L6       108623 SEA SSS FUL L4 AND L2
                SAV L6 TEMP BER748/A
L7        47889 SEA L6 AND ?PHOSPHO?/CNS
L8        46189 SEA L7 NOT PMS/CI
L9         6841 SEA L8 AND (TI OR ZR OR HF OR OS OR IR OR PT OR GE OR SN
                OR PB OR PO OR CE OR TH OR PA)/ELS
L10        2228 SEA L9 AND (ZR OR TI SN OR CE)/ELS

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L23        3412 SEA L22 AND L9
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L29          134 SEA L28 AND L10
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L32            1 SEA DIOXANE/CN
L33            1 SEA "METHANE, SULFINYLBIS-"/CN
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L38           76 SEA L36 AND L37
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L40           18 SEA L20
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L42        29783 SEA (ORG# OR ORGANIC)(2A)(SOLUTION? OR SOLN#)
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L50            4 SEA L48 AND L42
L51            5 SEA L50 OR L45
L52           26 SEA (L44 OR L49) NOT L51


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L2               STR

M 1

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DEFAULT ECLEVEL IS LIMITED

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STEREO ATTRIBUTES: NONE
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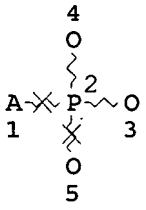

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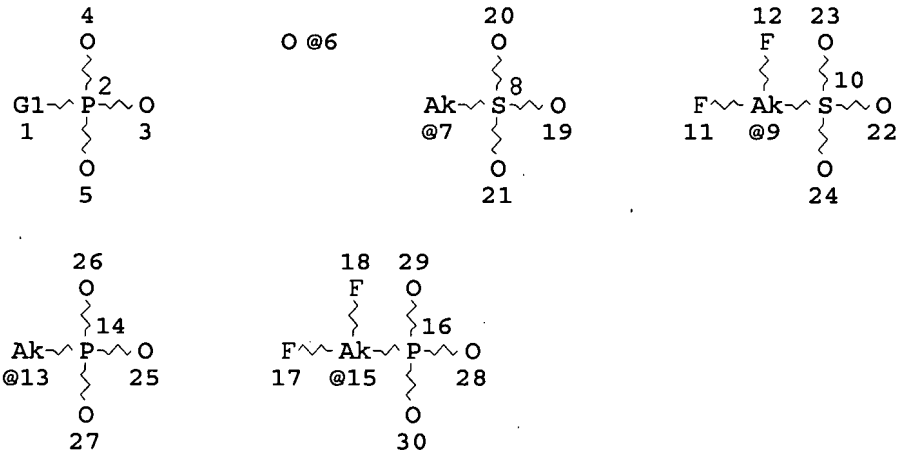

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DEFAULT ECLEVEL IS LIMITED

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STEREO ATTRIBUTES: NONE

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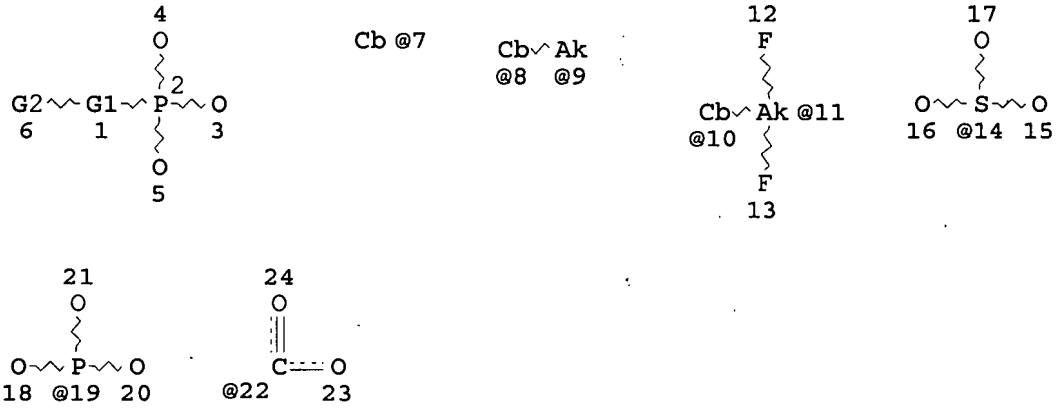

VAR G1=7/8-6 9-2/9-6 8-2/10-6 11-2/11-6 10-2
VAR G2=14/19/22
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NSPEC IS RC AT 2
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CONNECT IS E2 RC AT 9
DEFAULT MLEVEL IS ATOM
GGCAT IS MCY UNS AT 7
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GGCAT IS MCY UNS AT 10
DEFAULT ECLEVEL IS LIMITED

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STEREO ATTRIBUTES: NONE

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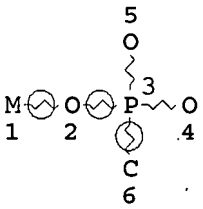

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DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
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NUMBER OF NODES IS 6

STEREO ATTRIBUTES: NONE

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=> d l51 ibib abs hitstr hitind 1-5

L51 ANSWER 1 OF 5 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1193351 HCAPLUS
DOCUMENT NUMBER: 143:463097
TITLE: Precursor **organic solutions** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for the preparation of composite membrane for fuel cells working at temperatures >90° and/or at low relative humidity
INVENTOR(S): Alberti, Giulio; Pica, Monica; Tarpanelli, Tiziano
PATENT ASSIGNEE(S): Fuma-Tech Gesellschaft fuer Funktionelle Membranen und Anlagentechnologie MbH, Germany
SOURCE: PCT Int. Appl., 43 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

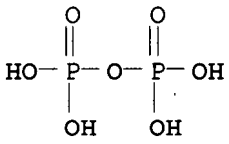
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005105667	A1	20051110	WO 2004-EP9262	200408 18
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2563567	A1	20051110	CA 2004-2563567	200408

18
EP 1747172 A1 20070131 EP 2004-764248
200408
18
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LI, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR
PRIORITY APPLN. INFO.: IT 2004-PG13 A
200404
30
WO 2004-EP9262 W
200408
18

AB The invention is based on the preparation of precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates M(IV)(O3P-OH)2, M(IV)[O2P(OH)2]2[O2PO(OH)] and M(IV)P2O7 (M = Zr, Hf, Ti). An important property of these solns. is that the compds. are formed when the solvent is evaporated This peculiarity allows an easy insertion of the compds. inside the pores of porous membranes, in polymeric membranes and in the electrode interfaces of fuel cells. The acid properties of their surfaces, the high thermal stability and the insoly. in water make these particles extremely of interest for improving the efficiency of PEMFCs in the temperature range 90-130°. The peculiar characteristics of nonwater assisted proton conductivity of M(IV)[O2P(OH)2]2[O2PO(OH)] compds. open new prospects for their application in PEMFCs at low relative humidity.

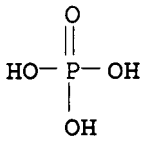
IT **13565-97-4P**, Zirconium pyrophosphate **13772-29-7P**
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

RN 13565-97-4 HCAPLUS
CN Diphosphoric acid, zirconium(4+) salt (1:1) (9CI) (CA INDEX NAME)



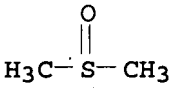
● Zr(IV)

RN 13772-29-7 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)

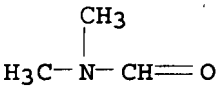


●1/2 Zr(IV)

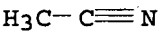
IT **67-68-5**, Dmso, uses **68-12-2**, Dmf, uses
75-05-8, Acetonitrile, uses **123-91-1**, Dioxane,
uses **872-50-4**, n-Methyl-2-pyrrolidone, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(precursor **organic solns.** of tetravalent metal
phosphates and pyrophosphates and their use for electrode
modification and for preparation of composite membrane for fuel cells)
RN 67-68-5 HCAPLUS
CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



RN 68-12-2 HCAPLUS
CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)

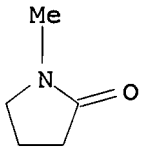


RN 75-05-8 HCAPLUS
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



RN 123-91-1 HCAPLUS
CN 1,4-Dioxane (9CI) (CA INDEX NAME)

RN 872-50-4 HCAPLUS
CN 2-Pyrrolidinone, 1-methyl- (7CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C01B025-37
ICS B01J027-16; H01M008-00; B01D071-02; H01G009-00; C01B025-42
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
IT Alcohols, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(aliphatic, C≥4; precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)
IT Titanates
RL: TEM (Technical or engineered material use); USES (Uses)
(alkoxides; precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)
IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)
IT Carboxylic acids, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(perfluoro, polymers, sulfonated; precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)
IT Sulfonic acids, uses
RL: DEV (Device component use); USES (Uses)
(perfluorosulfonic acid polymers; precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)
IT Polyketones
Polysulfones, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polyether-, sulfonated; precursor **organic solns** . of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)
IT Polyethers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polyketone-, sulfonated; precursor **organic solns** . of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)
IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; precursor **org** . **solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for

preparation of composite membrane for fuel cells)

IT Ionomers
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT Polyethers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polysulfone-, sulfonated; precursor **organic solns**. of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT Membranes, nonbiological
(porous; precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT Ceramic membranes
Fuel cell electrodes
Gels
Nanoparticles
(precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT Chlorides, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT Diphosphates
RL: TEM (Technical or engineered material use); USES (Uses)
(precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT Metal alkoxides
RL: TEM (Technical or engineered material use); USES (Uses)
(precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT Phosphates, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT Fuel cells
(proton exchange membrane; precursor **organic solns**. of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT Carboxylic acids, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(salts; precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT Fluoropolymers, uses

RL: DEV (Device component use); USES (Uses)
(sulfo-containing, perfluoro; precursor **organic solns** . of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT Metal alkoxides
RL: TEM (Technical or engineered material use); USES (Uses)
(titanium; precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT 7664-38-2, Phosphoric acid, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT 7440-44-0, ELAT, uses 9002-84-0, PTFE
RL: DEV (Device component use); USES (Uses)
(precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT 7440-58-6DP, Hafnium, compds with oxygen, chlorine, and propanoic acid 13470-09-2P, Titanium pyrophosphate **13565-97-4P**, Zirconium pyrophosphate 13765-94-1P **13772-29-7P** 25507-14-6P 27607-66-5P, Hafnium phosphate 869110-08-7P, Zirconium hydroxide phosphate (Zr(OH)0.6(HPO4)1.7)
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

IT 67-56-1, Methanol, uses **67-68-5**, Dmso, uses **68-12-2**, Dmf, uses 71-23-8, 1-Propanol, uses **75-05-8**, Acetonitrile, uses 109-99-9, Thf, uses **123-91-1**, Dioxane, uses 127-19-5, n,n-Dimethylacetamide 623-37-0, 3-Hexanol **872-50-4**, n-Methyl-2-pyrrolidone, uses 7440-32-6D, Titanium, salt 7440-58-6D, Hafnium, salt 7440-67-7D, Zirconium, salt 13499-05-3, Hafnium tetrachloride 68926-31-8
RL: TEM (Technical or engineered material use); USES (Uses)
(precursor **organic solns.** of tetravalent metal phosphates and pyrophosphates and their use for electrode modification and for preparation of composite membrane for fuel cells)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

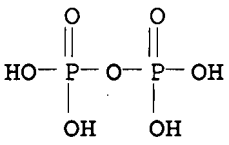
L51 ANSWER 2 OF 5 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:969513 HCAPLUS
DOCUMENT NUMBER: 144:394408
TITLE: New preparation methods for composite membranes for medium temperature fuel cells based on precursor solutions of insoluble inorganic compounds
AUTHOR(S): Alberti, G.; Casciola, M.; Pica, M.; Tarpanelli, T.; Sganappa, M.
CORPORATE SOURCE: Chemical Department, Perugia University, Centro di Eccellenza Materiali Innovativi Nanostrutturati, Perugia, Italy
SOURCE: Fuel Cells (Weinheim, Germany) (2005), 5(3),

366-374
CODEN: FUCEFK; ISSN: 1615-6846
PUBLISHER: Wiley-VCH Verlag GmbH & Co. KGaA
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Current PEMFCs, using perfluorinated membranes, can only operate at temps. ≤70-80°C, since their performance is dramatically reduced at higher temps. Encouraging results, for avoiding the reduction in performance, can be obtained by filling Nafion membranes with inorg. nano-particles (composite membranes) and/or by adding inorg. nano-particles at the membrane/electrode interfaces. However, the efficient insertion of nano-particles, other than metal oxides, inside a polymeric matrix is often very complicated or not possible. Therefore, it was of interest to find simpler methods for the insertion. The preparation of **organic** precursor **solns** . of the insol. compound Zr(O3P-OH)(O3P-C6H4SO3H), a proton conductor exhibiting very high conductivity (10-1 S cm-1 at 100° and 90 %RH) is reported. These precursor solns. are more stable the higher the Kb of the solvent and the lower the temperature Precursor solns., stable for many days at room temperature, were found by using proton acceptor solvents, such as alkanols, N,N-DMF, and N-Me pyrrolidone (NMP). The particularity of these solns. is that insol. phosphonate particles are formed when the solvent is evaporated They are therefore very suitable for filling porous membranes, for the preparation of composite proton conducting membranes, and for the preparation of composite electrodes. Some examples of preparation and use are reported and discussed.

IT **13565-97-4**
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(new preparation methods for composite membranes for medium temperature fuel cells based on precursor solns. of insol. inorg. compds.)

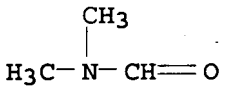
RN 13565-97-4 HCAPLUS
CN Diphosphoric acid, zirconium(4+) salt (1:1) (9CI) (CA INDEX NAME)



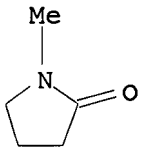
● Zr(IV)

IT **68-12-2**, N,N-DiMethylFormamide, uses **872-50-4**, N-Methyl pyrrolidone, uses
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(new preparation methods for composite membranes for medium temperature fuel cells based on precursor solns. of insol. inorg. compds.)

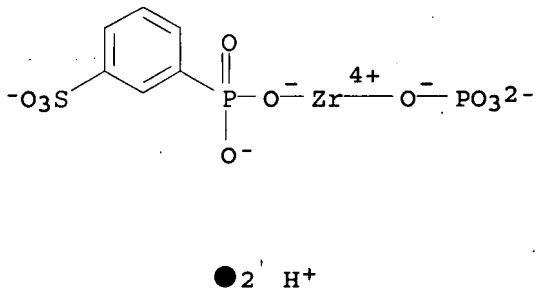
RN 68-12-2 HCAPLUS
CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 872-50-4 HCAPLUS
CN 2-Pyrrolidinone, 1-methyl- (7CI, 8CI, 9CI) (CA INDEX NAME)



IT **116405-42-6P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(new preparation methods for composite membranes for medium temperature fuel cells based on precursor solns. of insol. inorg. compds.)
RN 116405-42-6 HCAPLUS
CN Zirconate(2-), [phosphato(3-)-κO][3-(phosphono-κO)benzenesulfonato(3-)]-, dihydrogen (9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 49
IT **13565-97-4**
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(new preparation methods for composite membranes for medium temperature fuel cells based on precursor solns. of insol. inorg. compds.)
IT 67-63-0, 2-Propanol, uses **68-12-2**, N,N-DiMethylFormamide, uses 71-23-8, Propanol, uses **872-50-4**, N-Methyl pyrrolidone, uses
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)
(new preparation methods for composite membranes for medium temperature fuel cells based on precursor solns. of insol. inorg. compds.)
IT **116405-42-6P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(new preparation methods for composite membranes for medium temperature fuel cells based on precursor solns. of insol. inorg. compds.)
REFERENCE COUNT: 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE

IN THE RE FORMAT

L51 ANSWER 3 OF 5 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:778142 HCAPLUS
DOCUMENT NUMBER: 139:294647
TITLE: An innovative method for the preparation of proton conducting nanopolymeric membranes for use in fuel cells or in catalytic membrane reactors
INVENTOR(S): Alberti, Giulio; Casciola, Mario; Pica, Monica
PATENT ASSIGNEE(S): Fuma-Tech G.m.b.H., Germany; Fuma-Tech Gesellschaft Fuer Funktionelle Membranen
SOURCE: PCT Int. Appl., 31 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003081691	A2	20031002	WO 2003-EP2904	20030320
WO 2003081691	A3	20050623		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
IT 2002PG0015	A1	20030922	IT 2002-PG15	20020322
CA 2479314	A1	20031002	CA 2003-2479314	20030320
AU 2003226671	A1	20031008	AU 2003-226671	20030320
US 2005164092	A1	20050728	US 2003-508748	20030320
EP 1563559	A2	20050817	EP 2003-744819	20030320
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
JP 2005527545	T	20050915	JP 2003-579295	20030320

PRIORITY APPLN. INFO.: IT 2002-PG15 A 20020322

22

WO 2003-EP2904 W 200303 20

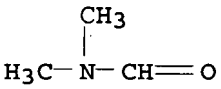
AB The invention is based on the preparation of an **organic solution** of preferably phosphonic acids and tetravalent metals salts, preferably of Zr, Ti, Sn and Ce, in organic solvents, which behaves as a solution of layered tetravalent metals salts, preferably phosphate-phosphonates, which are completely insol. in the known solvents. This peculiarity allows an easy insertion of particles of the above compds. in the pores of porous membranes, in the matrixes of those polymers, which are soluble in the same organic solvents, as well as in the membrane/electrode interfaces of fuel cells. The use of tetravalent metals salts, preferably zirconium phosphate-phosphonates, possessing high proton conductivity (in some cases higher than 10-1 S cm-1) allows the preparation of impregnated porous membranes and of nano-polymeric membranes combining good mech. properties, and/or reduced permeability to gaseous species, with good proton conductivity These membranes can therefore be employed in fuel cells even at temps. higher than 80°. These membranes also possess a high catalytic activity and can therefore be employed in catalytic membrane reactors.

IT **60-35-5**, Acetamide, uses **67-68-5**, Dmso, uses **68-12-2**, Dmf, uses **75-05-8**, Acetonitrile, uses **123-91-1**, Dioxan, uses **872-50-4**, n-Methyl-2-pyrrolidone, uses
RL: DEV (Device component use); USES (Uses)
(innovative method for preparation of proton conducting nanopolymeric membranes for use in fuel cells or in catalytic membrane reactors)

RN 60-35-5 HCAPLUS
CN Acetamide (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

RN 67-68-5 HCAPLUS
CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)

RN 68-12-2 HCAPLUS
CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)

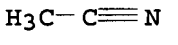


RN 75-05-8 HCAPLUS

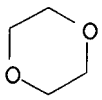
claim 8

02/28/2007

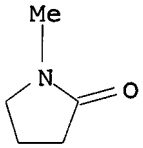
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



RN 123-91-1 HCAPLUS
CN 1,4-Dioxane (9CI) (CA INDEX NAME)



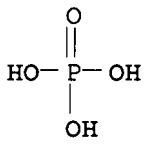
RN 872-50-4 HCAPLUS
CN 2-Pyrrolidinone, 1-methyl- (7CI, 8CI, 9CI) (CA INDEX NAME)



Claim 8

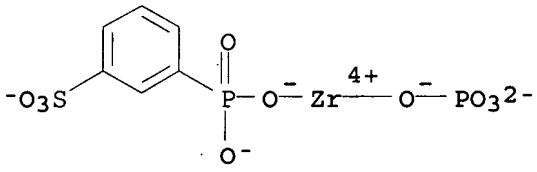
IT **13772-29-7DP**, solid solution with zirconium phosphate and phosphonate containing organic diacids **116405-42-6P** **131249-73-5DP**, solid solution with zirconium phosphate and phosphonate containing organic diacids **608103-65-7DP**, solid solution with zirconium phosphate and phosphonate containing organic diacids **608103-65-7P**
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(innovative method for preparation of proton conducting nanopolymeric membranes for use in fuel cells or in catalytic membrane reactors)

RN 13772-29-7 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)



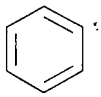
●1/2 Zr(IV)

RN 116405-42-6 HCAPLUS
CN Zirconate(2-), [phosphato(3-)-κO][3-(phosphono-κO)benzenesulfonato(3-)]-, dihydrogen (9CI) (CA INDEX NAME)



●2 H^+

RN 131249-73-5 HCAPLUS
CN Benzenesulfonic acid, phosphono-, zirconium(4+) salt (2:1) (9CI) (CA INDEX NAME)

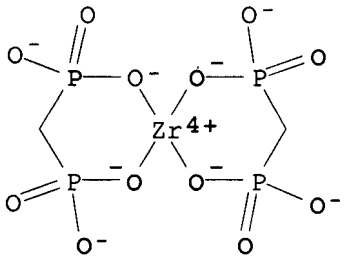


D1—SO_3H

D1—PO_3H_2

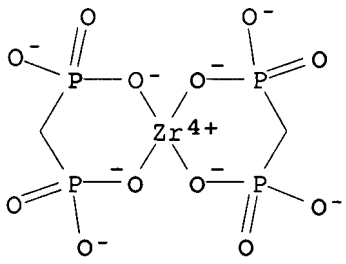
●1/2 Zr(IV)

RN 608103-65-7 HCAPLUS
CN Zirconate(4-), bis[[methylenebis[phosphonato-κO]](4-)]-, tetrahydrogen, (T-4)- (9CI) (CA INDEX NAME)



●4 H^+

RN 608103-65-7 HCAPLUS
CN Zirconate(4-), bis[[methylenebis[phosphonato-κO]](4-)]-, tetrahydrogen, (T-4)- (9CI) (CA INDEX NAME)



● 4 H^+

IC ICM H01M
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 47
IT **60-35-5**, Acetamide, uses **67-68-5**, Dmso, uses **68-12-2**, Dmf, uses **75-05-8**, Acetonitrile, uses **123-91-1**, Dioxan, uses **872-50-4**, n-Methyl-2-pyrrolidone, uses 7440-31-5D, Tin, salts 7440-32-6D, Titanium, salts 7440-45-1D, Cerium, salts 7440-67-7D, Zirconium, salts 7699-43-6, Zirconyl chloride 9002-84-0, Ptfe 15477-76-6, Phosphonate 24937-79-9, Pvdf 25710-96-7, Zirconium propionate 93615-63-5, Nafion 1100
RL: DEV (Device component use); USES (Uses)
(innovative method for preparation of proton conducting nanopolymeric membranes for use in fuel cells or in catalytic membrane reactors)
IT **13772-29-7DP**, solid solution with zirconium phosphate and phosphonate containing organic diacids **116405-42-6P** **131249-73-5DP**, solid solution with zirconium phosphate and phosphonate containing organic diacids **608103-65-7DP**, solid solution with zirconium phosphate and phosphonate containing organic diacids **608103-65-7P**
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(innovative method for preparation of proton conducting nanopolymeric membranes for use in fuel cells or in catalytic membrane reactors)

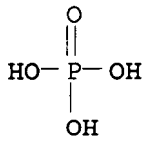
L51 ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:806621 HCAPLUS
DOCUMENT NUMBER: 136:237427
TITLE: Rhodium thiolate hydroformylation complexes tethered to delamellated γ-zirconium phosphate
AUTHOR(S): Rojas, Sergio; Murcia-Mascaros, Sonia; Terreros, Pilar; Fierro, Jose Luis Garcia
CORPORATE SOURCE: Instituto de Catalisis y Petroleoquimica, CSIC, Cantoblanco, Madrid, 28049, Spain
SOURCE: New Journal of Chemistry (2001), 25(11), 1430-1437
CODEN: NJCHE5; ISSN: 1144-0546
PUBLISHER: Royal Society of Chemistry
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Rhodium thiolate complexes intercalated in crystalline γ-zirconium phosphate or tethered to SiO2-modified γ-zirconium phosphate have been synthesized. It was observed that the addition of a **solution** of **organic** silicates to a colloidal suspension of γ-zirconium phosphate yielded amorphous substrates, which displayed very high specific areas (160-650 m2 g-1). Incorporation of a mercaptocarbonyl rhodium complex resulted in a highly selective and active catalyst precursor for the hydroformylation of 1-heptene in the liquid phase. Elemental anal. and photoelectron spectroscopy of the fresh and used samples revealed that some metal leaching occurs during the reaction, this being mainly confined to the outer layers of the solid particles. This observation, together with the high selectivity towards linear aldehydes, makes SiO2-modified γ-zirconium phosphate a good support candidate for immobilized Rh catalysts. Spectroscopic data obtained from the crystalline precursor and also from the amorphous catalyst showed that the interaction between the rhodium complex and the acid support was achieved via hydrogen bonds, forming NH groups.

IT **13772-29-7**, Zirconium phosphate
RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
(rhodium thiolate hydroformylation complexes tethered to delamellated γ-zirconium phosphate)

RN 13772-29-7 HCAPLUS

CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)



●1/2 Zr(IV)

CC 67-2 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 23, 45

IT 7631-86-9, Silica, uses **13772-29-7**, Zirconium phosphate
RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
(rhodium thiolate hydroformylation complexes tethered to delamellated γ-zirconium phosphate)

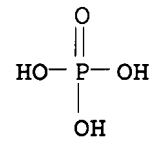
REFERENCE COUNT: 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L51 ANSWER 5 OF 5 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1976:112147 HCAPLUS
DOCUMENT NUMBER: 84:112147
TITLE: Cation exchange selectivity in aqueous-organic solvent mixtures, and solvation in the external phase
AUTHOR(S): Smits, Robert; Massart, Desire L.; Juillard, Jean; Morel, Jean P.
CORPORATE SOURCE: Pharm. Inst., Vrije Univ. Brussel, Sint-Genesius-Rode, Belg.
SOURCE: Analytical Chemistry (1976), 48(3), 458-64

CODEN: ANCHAM; ISSN: 0003-2700
DOCUMENT TYPE: Journal
LANGUAGE: English

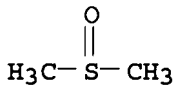
AB The importance of solvation in the external phase in establishing the selectivity of a strongly acidic cation exchanger is investigated in a large number of mixed water-organic solvent systems. The exchange behavior of Dowex 50W-X8 200-400 mesh resins is investigated for the systems Rb+/H+, Na+/H+, Ag+/H+ and Li+/H+. The relationship between selectivity coeffs. KH+M+ and transfer free energy factors g1(M+-H+) is studied. An excellent correlation between both quantities is found for crystalline zirconium phosphate, indicating that the selectivity of an ion exchanger can indeed be predicted from variations of Gibbs free energies of transfer. The agreement is not so good for organic sulfonic cation exchangers. This can be explained by effects in the resin phase. A simple model is presented, permitting estimation of the variations with organic solvent content of the chemical potentials in the resin phase, knowing the quantities of organic solvent absorbed. These considerations lead to a simple model which allows a nearly quant. explanation of the selectivity behavior of cation exchangers in mixed solvents.

IT **13765-95-2**
RL: PRP (Properties)
(alkali metal cation exchange on, aqueous-organic solvent effects on)
RN 13765-95-2 HCAPLUS
CN Phosphoric acid, zirconium salt (8CI, 9CI) (CA INDEX NAME)

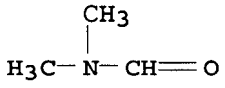


●x Zr(x)

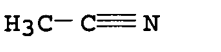
IT **67-68-5**, properties **68-12-2**, properties
75-05-8, properties **123-91-1**
RL: PRP (Properties)
(solvent effect of aqueous, on alkali metal cation exchange)
RN 67-68-5 HCAPLUS
CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



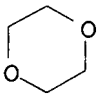
RN 68-12-2 HCAPLUS
CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 75-05-8 HCAPLUS
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



RN 123-91-1 HCAPLUS
CN 1,4-Dioxane (9CI) (CA INDEX NAME)



CC 66-4 (Surface Chemistry and Colloids)
Section cross-reference(s): 68
IT 11119-67-8 **13765-95-2**
RL: PRP (Properties)
(alkali metal cation exchange on, aqueous-organic solvent effects on)
IT 7647-01-0, properties
RL: PRP (Properties)
(free energy of transfer of alkali cations between aqueous and aqueous-**organic solns.** containing)
IT 7697-37-2, properties
RL: PRP (Properties)
(free energy of transfer of silver between aqueous and aqueous-**organic solns.** containing)
IT 57-13-6, properties 64-17-5, properties 67-56-1, properties 67-63-0, properties 67-64-1, properties **67-68-5**, properties **68-12-2**, properties 71-23-8, properties **75-05-8**, properties 75-65-0 109-86-4 109-99-9, properties **123-91-1** 126-33-0
RL: PRP (Properties)
(solvent effect of aqueous, on alkali metal cation exchange)

=> d l52 ibib abs hitstr hitind 1-26

L52 ANSWER 1 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:31215 HCAPLUS
DOCUMENT NUMBER: 146:125333
TITLE: Polymeric electrolyte membranes capable of being operated at high temperature for fuel cells, their manufacture, and fuel cell system
INVENTOR(S): Song, Min Gyu; Yoon, Hae Gwon; Park, Yeong Mi
PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea
SOURCE: Jpn. Kokai Tokkyo Koho, 19pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007005308	A	20070111	JP 2006-172602	

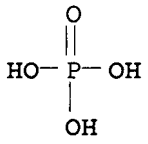
				200606 22
US 2007015023	A1	20070118	US 2006-474065	200606 23
CN 1891741	A	20070110	CN 2006-10090868	200606 26
PRIORITY APPLN. INFO.:			KR 2005-54955 A	200506 24

AB The membranes contain inorg. metal salt ionic conductors, e.g., phosphotungstic acid Cs salts, and conductive cation exchange resins. Preferably, the membranes further contain inorg. additives, e.g., SiO2, clay. The membranes are manufactured by reaction of metal compds. with inorg. ionic conductors in solvents, e.g., alcs., H2O, mixing of the resulting salts with the cation exchange resins, and casting or charge induction spinning of the mixts. Crossover of hydrocarbon fuels, e.g., MeOH through the membranes is prevented.

IT **13772-29-7DP**, Zirconium hydrogen phosphate, cesium-exchanged
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manufacture of polymeric electrolyte membranes containing conductive cation exchange resins and inorg. metal salt ionic conductors for fuel cells)

RN 13772-29-7 HCAPLUS

CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)

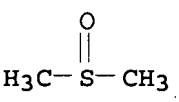


●1/2 Zr(IV)

IT **67-68-5**, Dimethyl sulfoxide **68-12-2**, Dimethylformamide, uses **872-50-4**, N-Methyl-2-pyrrolidinone, uses
RL: NUU (Other use, unclassified); USES (Uses)
(solvent for salt formation; manufacture of polymeric electrolyte membranes containing conductive cation exchange resins and inorg. metal salt ionic conductors for fuel cells)

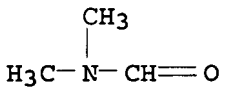
RN 67-68-5 HCAPLUS

CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)

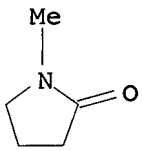


RN 68-12-2 HCAPLUS

CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 872-50-4 HCAPLUS
CN 2-Pyrrolidinone, 1-methyl- (7CI, 8CI, 9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 49
IT **13772-29-7DP**, Zirconium hydrogen phosphate, cesium-exchanged
70712-39-9DP, Tungsten oxide phosphate (W24O69(PO4)2), cesium, sodium, or calcium salt
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(manufacture of polymeric electrolyte membranes containing conductive cation exchange resins and inorg. metal salt ionic conductors for fuel cells)
IT 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 67-64-1, Acetone, uses **67-68-5**, Dimethyl sulfoxide **68-12-2**, Dimethylformamide, uses 78-59-1, Isophorone 78-93-3, Methyl ethyl ketone, uses 96-48-0, Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 107-21-1D, 1,2-Ethanediol, ethers 108-10-1, Methyl isobutyl ketone 108-32-7, Propylene carbonate 108-83-8, Diisobutyl ketone 108-94-1, Cyclohexanone, uses 109-99-9, Tetrahydrofuran, uses 112-15-2, Carbitol acetate 123-42-2, Diacetone alcohol 123-86-4, N-Butyl acetate 127-19-5, Dimethylacetamide 141-97-9, Ethyl acetoacetate 512-56-1, Trimethyl phosphate 616-38-6, Dimethyl carbonate 632-22-4, Tetramethylurea **872-50-4**, N-Methyl-2-pyrrolidinone, uses 7732-18-5, Water, uses 62309-51-7, Propanol
RL: NUU (Other use, unclassified); USES (Uses)
(solvent for salt formation; manufacture of polymeric electrolyte membranes containing conductive cation exchange resins and inorg. metal salt ionic conductors for fuel cells)

L52 ANSWER 2 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:358666 HCAPLUS
DOCUMENT NUMBER: 144:373097
TITLE: Method of fabrication of polymer electrolyte for a direct oxidation fuel cell
INVENTOR(S): Song, Min-Kyu; Kim, You-Mee; Kweon, Ho-Jin; Rhee, Hee-Woo
PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea
SOURCE: Eur. Pat. Appl., 32 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

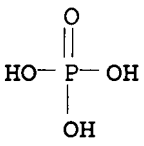
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1648047	A1	20060419	EP 2005-109576	20051014
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
KR 2006048562	A	20060518	KR 2005-55834	20050627
JP 2006114502	A	20060427	JP 2005-299086	20051013
CN 1764001	A	20060426	CN 2005-10113723	20051014
US 2006251945	A1	20061109	US 2005-251579	20051014
PRIORITY APPLN. INFO.:			KR 2004-82155 A	20040414
			KR 2005-55834 A	20050627

AB A polymer electrolyte membrane for a direct oxidation fuel cell includes a porous polymer supporter having a plurality of pores, and a hydrocarbon fuel diffusion barrier layer which is formed on the polymer supporter and contains an inorg. additive dispersed in a cation exchange resin.

IT **13772-29-7**
RL: MOA (Modifier or additive use); USES (Uses)
(method of fabrication of polymer electrolyte for direct oxidation fuel cell)

RN 13772-29-7 HCAPLUS

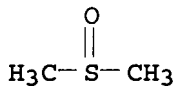
CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)



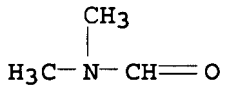
●1/2 Zr(IV)

IT **67-68-5**, Dmso, uses **68-12-2**, Dmf, uses **872-50-4**, N-Methyl-2-pyrrolidone, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(solvent; method of fabrication of polymer electrolyte for direct oxidation fuel cell)

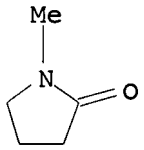
RN 67-68-5 HCAPLUS
CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



RN 68-12-2 HCAPLUS
CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 872-50-4 HCAPLUS
CN 2-Pyrrolidinone, 1-methyl- (7CI, 8CI, 9CI) (CA INDEX NAME)



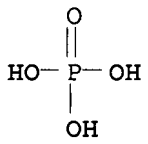
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
IT 1318-00-9, Vermiculite 1318-74-7, Kaolinite, uses 1318-93-0, Montmorillonite, uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 12047-27-7, Barium titanate, uses 12173-47-6, Fluorohectorite 12173-60-3, Illite 12269-78-2, Pyrophyllite **13772-29-7** 14807-96-6, Talc, uses 126038-70-8, Aminohexane
RL: MOA (Modifier or additive use); USES (Uses)
(method of fabrication of polymer electrolyte for direct oxidation fuel cell)
IT 67-63-0, 2-Propanol, uses 67-64-1, Acetone, uses **67-68-5**, Dmso, uses **68-12-2**, Dmf, uses 71-23-8, 1-Propanol, uses 78-59-1, Isophorone 78-93-3, Methyl ethyl ketone, uses 96-48-0, Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 108-83-8, Diisobutyl ketone 108-94-1, Cyclohexanone, uses 109-99-9, Thf, uses 112-15-2, Carbitol acetate 123-42-2, Diacetone alcohol 123-86-4, n-Butyl acetate 127-19-5, Dimethylacetamide 141-97-9, Ethyl acetoacetate 512-56-1, Trimethylphosphate 616-38-6, Dimethyl carbonate 632-22-4, Tetramethylurea **872-50-4**, N-Methyl-2-pyrrolidone, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(solvent; method of fabrication of polymer electrolyte for direct oxidation fuel cell)
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L52 ANSWER 3 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1066087 HCAPLUS

DOCUMENT NUMBER: 144:7496
TITLE: Gels of zirconium phosphate in organic solvents and their use for the preparation of polymeric nanocomposites
AUTHOR(S): Casciola, Mario; Alberti, Giulio; Donnadio, Anna; Pica, Monica; Marmottini, Fabio; Bottino, Aldo; Piaggio, Paolo
CORPORATE SOURCE: Dipartimento di Chimica, Centro di Eccellenza Materiali Innovativi Nanostrutturati (CEMIN), Universita di Perugia, Perugia, 06123, Italy
SOURCE: Journal of Materials Chemistry (2005), 15(39), 4262-4267
CODEN: JMACEP; ISSN: 0959-9428
PUBLISHER: Royal Society of Chemistry
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Gels of α-zirconium phosphate (α-ZrP) in water have been prepared by exfoliation of crystalline α-ZrP induced by intercalation-deintercalation of propylamine. Although these gels are X-ray amorphous, their Raman spectra indicate that the α-type layers of the starting material remain essentially unaltered. Replacement of gel water with water miscible organic solvents has allowed the formation of α-ZrP gels in a great variety of solvents, such as alkanol, N,N-dimethylformamide (DMF), 1-methyl-2-pyrrolidone, acetone, THF and even chloroform. Particular attention has been devoted to α-ZrP gels in DMF. On the basis of the surface area of the dry gels, the average thickness of the particles of exfoliated α-ZrP has been estimated between 25 and 80 nm for α-ZrP percentages in the starting gels between 2.5 and 10 wt%, resp., in agreement with SEM images. α-ZrP gels in THF have been used for the preparation of polystyrene/α-ZrP nanocomposites with filler loadings up to 8 wt%. The presence of exfoliated α-ZrP delays the beginning of thermal decomposition of the polymer by a maximum of 45 °C for 4 wt% filler loading. The state of filler exfoliation has been confirmed by transmission electron microscopy.

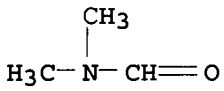
IT **13772-29-7**
RL: MOA (Modifier or additive use); USES (Uses)
(gels of zirconium phosphate in organic solvents for nanocomposite)
RN 13772-29-7 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)



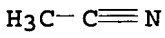
●1/2 Zr(IV)

IT **68-12-2**, DMF, uses **75-05-8**, Acetonitrile, uses **872-50-4**, NMP, uses
RL: NUU (Other use, unclassified); USES (Uses)
(gels of zirconium phosphate in organic solvents for nanocomposite)
RN 68-12-2 HCAPLUS

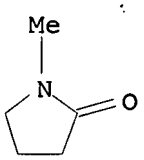
CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 75-05-8 HCAPLUS
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



RN 872-50-4 HCAPLUS
CN 2-Pyrrolidinone, 1-methyl- (7CI, 8CI, 9CI) (CA INDEX NAME)



CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 38
IT **13772-29-7**
RL: MOA (Modifier or additive use); USES (Uses)
(gels of zirconium phosphate in organic solvents for nanocomposite)
IT 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 67-64-1, Acetone, uses 67-66-3, Chloroform, uses **68-12-2**, DMF, uses 71-23-8, n-Propanol, uses **75-05-8**, Acetonitrile, uses 109-99-9, THF, uses **872-50-4**, NMP, uses 7732-18-5, Water, uses
RL: NUU (Other use, unclassified); USES (Uses)
(gels of zirconium phosphate in organic solvents for nanocomposite)
REFERENCE COUNT: 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

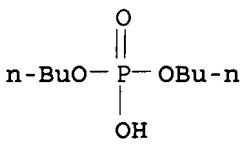
L52 ANSWER 4 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:901743 HCAPLUS
DOCUMENT NUMBER: 144:422379
TITLE: Radiation Chemical Behavior of Tributyl Phosphate, Dibutylphosphoric Acid, and Its Zirconium Salt in **Organic Solutions** and Two-Phase Systems
AUTHOR(S): Egorov, G. F.; Tkhorzhnitskii, G. P.; Zilberman, B. Ya.; Shmidt, O. V.; Goletskii, N. D.
CORPORATE SOURCE: Frumkin Institute of Electrochemistry, Russian Academy of Sciences, Moscow, Russia
SOURCE: Radiochemistry (New York, NY, United States) (2005), 47(4), 392-397
CODEN: RDIOEO; ISSN: 1066-3622
PUBLISHER: Pleiades Publishing, Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Radiation-induced and hydrolytic decomposition of HDBP and its zirconium

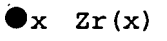
salt in **organic solns.** and two-phase aqueous-organic systems in the presence of TBP and nitric acid is studied. The yields of radiation-induced decomposition of HDBP and temperature dependences of its hydrolysis rate consts. are determined Kinetic equations for radiation-induced decomposition of HDBP are derived.

IT **73008-63-6**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(radiation chemical behavior of tri-Bu phosphate dibutylphosphoric acid and its zirconium salt in **organic solns.** and two-phase systems)

RN 73008-63-6 HCAPLUS

CN Phosphoric acid, dibutyl ester, zirconium salt (9CI) (CA INDEX NAME)





CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT Activation energy
Hydrolysis
Hydrolysis kinetics
Radiolysis
(radiation chemical behavior of tri-Bu phosphate dibutylphosphoric acid and its zirconium salt in **organic solns.** and two-phase systems)

IT 107-66-4, Dibutyl hydrogen phosphate 126-73-8, Tributyl phosphate, reactions **73008-63-6**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(radiation chemical behavior of tri-Bu phosphate dibutylphosphoric acid and its zirconium salt in **organic solns.** and two-phase systems)

IT 7697-37-2, Nitric acid, reactions
RL: RGT (Reagent); RACT (Reactant or reagent)
(radiation chemical behavior of tri-Bu phosphate dibutylphosphoric acid and its zirconium salt in **organic solns.** and two-phase systems)

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

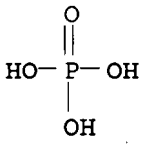
L52 ANSWER 5 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:638259 HCAPLUS
DOCUMENT NUMBER: 143:156319
TITLE: Polymer nanocomposite membranes, their manufacture, and their use for membrane-electrode assemblies and polymer

electrolyte fuel cells
INVENTOR(S): Lee, Hee-Wu; Song, Ming-Gyu; Kim, Young-Taek; Park, Seung-Bae; Park, Jin-Ki
PATENT ASSIGNEE(S): Hyundai Motor Corp., S. Korea; Kia Motors Corp.
SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005197209	A	20050721	JP 2004-258793	20040906
US 2005170229	A1	20050804	US 2004-27328	20041229
US 7074510	B2	20060711		
PRIORITY APPLN. INFO.:			KR 2003-100130 A	20031230

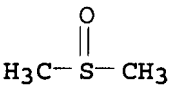
AB The polymer nanocomposite membranes comprise 30-95 weight% matrixes comprising ion-exchange resins having cation-exchange groups in side chains and 5-70 weight% finely and uniformly dispersed powders of solid H+ conductors. The polymer nanocomposite membranes are manufactured by (a) dissolving ion-exchange resins having cation-exchange groups in side chains into organic solvents to produce ion-exchange resin solns. (concentration 0.5-30 weight%), (b) mixing the solns. with porogens under high-frequency ultrasonic waves and forming polymer membranes, (c) extracting the porogens from the polymer membranes to form nanopores, and (d) filling the nanopores with solid H+ conductors so that 5-70 weight% of the solid H+ conductors are dispersed in 30-95 weight% of the ion-exchange resins. The nanocomposite membranes have high elec. conductivity at high temperature, good mech. properties, dimensional stability, and high fuel-separation performance are useful for membrane-electrode assemblies for polymer electrolyte fuel cells.

IT **13772-29-7P**
RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); PREP (Preparation); PROC (Process); USES (Uses)
(proton conductor; manufacture of porous polymer-solid proton conductor nanocomposite membranes for membrane-electrode assemblies and polymer electrolyte fuel cells)
RN 13772-29-7 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)

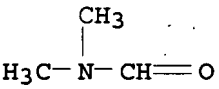


●1/2 Zr(IV)

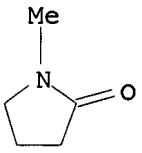
IT **67-68-5**, Dimethyl sulfoxide, uses **68-12-2**, Dimethylformamide, uses **872-50-4**, N-Methyl-2-pyrrolidone, uses
RL: NUU (Other use, unclassified); USES (Uses)
(solvent; manufacture of porous polymer-solid proton conductor nanocomposite membranes for membrane-electrode assemblies and polymer electrolyte fuel cells)
RN 67-68-5 HCAPLUS
CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



RN 68-12-2 HCAPLUS
CN Formamide, N,N-dimethyl- (8CI, 9CI) (CA INDEX NAME)



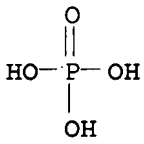
RN 872-50-4 HCAPLUS
CN 2-Pyrrolidinone, 1-methyl- (7CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01M008-02
ICS H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
IT **13772-29-7P**
RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); PREP (Preparation); PROC (Process); USES (Uses)
(proton conductor; manufacture of porous polymer-solid proton conductor nanocomposite membranes for membrane-electrode assemblies and polymer electrolyte fuel cells)
IT 60-29-7, Diethyl ether, uses 64-17-5, Ethanol, uses 67-56-1,

Methanol, uses 67-63-0, 2-Propanol, uses 67-64-1, Acetone, uses **67-68-5**, Dimethyl sulfoxide, uses **68-12-2**, Dimethylformamide, uses 78-59-1, Isophorone 78-93-3, Methyl ethyl ketone, uses 96-48-0, Butyrolactone 108-10-1, Methyl isobutyl ketone 108-83-8, Diisobutyl ketone 108-94-1, Cyclohexanone, uses 109-99-9, Tetrahydrofuran, uses 112-15-2, Carbitol acetate 115-10-6, Dimethyl ether 123-42-2, Diacetone alcohol 123-86-4, N-Butyl acetate 127-19-5, Dimethylacetamide 141-97-9, Ethyl acetoacetate 512-56-1, Trimethyl phosphate 632-22-4, Tetramethylurea **872-50-4**, N-Methyl-2-pyrrolidone, uses
RL: NUU (Other use, unclassified); USES (Uses)
(solvent; manufacture of porous polymer-solid proton conductor nanocomposite membranes for membrane-electrode assemblies and polymer electrolyte fuel cells)

L52 ANSWER 6 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:502083 HCAPLUS
DOCUMENT NUMBER: 139:206475
TITLE: Synthesis, Growth, and Er3+ Luminescence of Lanthanide Phosphate Nanoparticles
AUTHOR(S): Lehmann, O.; Meyssamy, H.; Koempe, K.; Schnablegger, H.; Haase, M.
CORPORATE SOURCE: Institut fuer Physikalische Chemie, Universitaet Hamburg, Hamburg, D-20146, Germany
SOURCE: Journal of Physical Chemistry B (2003), 107(30), 7449-7453
CODEN: JPCBFK; ISSN: 1520-6106
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The complete series of all nonradioactive lanthanide phosphates was prepared in **organic solution** as ligand-capped nanoparticles. In all cases, well-dispersed particles with mean sizes <10 nm were obtained. Despite the similar chemical properties of the lanthanides, the growth, the crystal structure, and the mean size of the nanocrystals are strongly affected by the lanthanide ion employed. Very small nanoparticles were obtained for lanthanides for which the lattice energies of the bulk tetragonal xenotime phase and the bulk monoclinic monazite phase are similar. These smaller nanoparticles do not show the expected phase transition from monoclinic to tetragonal and seem to have their own unique crystal structure. Possible explanations for these observations are discussed. Finally, the authors present the 1st results on the IR emission of Er3+-doped YbPO4 and (Lu, Yb)PO4 nanoparticles in solution
IT **13454-71-2P**, Cerium phosphate (CePO4)
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of rare earth phosphates as ligand-capped nanoparticles)
RN 13454-71-2 HCAPLUS
CN Phosphoric acid, cerium(3+) salt (1:1) (8CI, 9CI) (CA INDEX NAME)

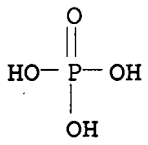


● Ce(III)

CC 78-5 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 73, 75
IT **13454-71-2P**, Cerium phosphate (CePO4) 13465-57-1P, Samarium phosphate (SmPO4) 13537-10-5P, Europium phosphate (EuPO4) 13628-51-8P, Gadolinium phosphate (GdPO4) 13863-48-4P, Terbium phosphate (TbPO4) 13863-49-5P, Dysprosium phosphate (DyPO4) 14298-31-8P, Praseodymium phosphate (PrPO4) 14298-32-9P, Neodymium phosphate (NdPO4) 14298-38-5P, Erbium phosphate (ErPO4) 14298-39-6P, Holmium phosphate (HoPO4) 15883-44-0P, Thulium phosphate (TmPO4)
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of rare earth phosphates as ligand-capped nanoparticles)
REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

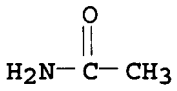
L52 ANSWER 7 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:427057 HCAPLUS
DOCUMENT NUMBER: 139:324974
TITLE: Tetravalent metal acid salts: solid acid catalysts for hydration of nitriles to amides
AUTHOR(S): Patel, Sonal M.; Chudasama, Uma V.; Ganeshpure, Pralhad A.
CORPORATE SOURCE: Applied Chemistry Department, Faculty of Technology and Engineering, M.S. University of Baroda, Vadodara, 390 001, India
SOURCE: Indian Journal of Chemistry, Section B: Organic Chemistry Including Medicinal Chemistry (2003), 42B(5), 1168-1169
CODEN: IJSBDB; ISSN: 0376-4699
PUBLISHER: National Institute of Science Communication
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 139:324974
AB Metal(IV) phosphates of tin, titanium, and zirconium have been applied as catalysts for hydration of nitriles to the amides. Tin(IV) phosphate showed higher activity than titanium and zirconium phosphates in the hydration of acetonitrile to acetamide. Effects of acetonitrile-water ratio and reaction temperature and time on the hydration of acetonitrile by tin phosphate have been investigated. Hydration of phenylacetonitrile and benzonitrile in the presence of tin phosphate catalyst gives the corresponding amides in moderate yields.
IT **13772-29-7**
RL: CAT (Catalyst use); USES (Uses)
(solid acid catalysts for hydration of nitriles to amides)
RN 13772-29-7 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX

NAME)

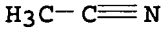


●1/2 Zr(IV)

IT **60-35-5P**, Acetamide, preparation
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(solid acid catalysts for hydration of nitriles to amides)
RN 60-35-5 HCAPLUS
CN Acetamide (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



IT **75-05-8**, Acetonitrile, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(solid acid catalysts for hydration of nitriles to amides)
RN 75-05-8 HCAPLUS
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23, 25, 67
IT **13772-29-7** 15142-98-0, Tin(IV) phosphate 17017-57-1, Titanium(IV) phosphate
RL: CAT (Catalyst use); USES (Uses)
(solid acid catalysts for hydration of nitriles to amides)
IT 55-21-0P, Benzamide **60-35-5P**, Acetamide, preparation 103-81-1P, Benzeneacetamide
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(solid acid catalysts for hydration of nitriles to amides)
IT **75-05-8**, Acetonitrile, reactions 100-47-0, Benzonitrile, reactions 140-29-4, Phenylacetonitrile
RL: RCT (Reactant); RACT (Reactant or reagent)
(solid acid catalysts for hydration of nitriles to amides)
REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L52 ANSWER 8 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:235994 HCAPLUS
DOCUMENT NUMBER: 136:263978
TITLE: Hybrid structures and production methods

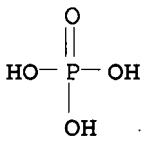
therefor
INVENTOR(S): Kondo, Yoshikazu
PATENT ASSIGNEE(S): Kansai Research Institute Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002088261	A	20020327	JP 2000-322009	200009 14

PRIORITY APPLN. INFO.: JP 2000-322009 200009 14

AB **Organic** polymer **solns.**, inorg. polymer dispersions, or inorg. compound dispersions containing fine granules of stratified inorg. compds. are subjected to an elec. field to give structures having oriented fillers. Thus, 1 dL H2O containing 0.1 g 5-amino-1-pentanol and 2 g Kunipia F and 0.1 dL H2O containing 2 g poly(vinyl alc.) were mixed in ratio 2:1, impressed with 5 V-d.c. with 2 electrodes to form a coating having a silicate layer parallel to the coating surface on the anode.

IT **13765-95-2**, Zirconium phosphate
RL: MOA (Modifier or additive use); USES (Uses)
(organic-inorg. hybrid structures and orientation by elec. field)
RN 13765-95-2 HCAPLUS
CN Phosphoric acid, zirconium salt (8CI, 9CI) (CA INDEX NAME)



●x Zr(x)

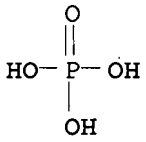
IC ICM C08L101-00
ICS B01J019-08; B05B005-08; C08J003-00; C08K007-18
CC 37-6 (Plastics Manufacture and Processing)
IT 1302-27-8, Biotite 1318-00-9, Vermiculite 1318-74-7, Kaolinite, uses 1318-93-0, Montmorillonite, uses 1318-94-1, Muscovite 1319-41-1, Saponite 7784-30-7, Aluminum phosphate 12001-29-5, Chrysotile 12026-53-8, Paragonite 12135-86-3, Antigorite 12172-85-9, Beidellite 12174-06-0, Nontronite 12251-00-2, Phlogopite 12269-78-2, Pyrophyllite 12279-65-1, Nacrite **13765-95-2**, Zirconium phosphate 13767-12-9, Octacalcium phosphate 14807-96-6, Talc, uses 21645-51-2, Aluminum hydroxide, uses 61164-11-2, Vanadium oxide phosphate 159704-92-4, Lucentite SWF 187247-40-1, Kunipia F
RL: MOA (Modifier or additive use); USES (Uses)

(organic-inorg. hybrid structures and orientation by elec. field)

L52 ANSWER 9 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:448799 HCAPLUS
DOCUMENT NUMBER: 136:167223
TITLE: Metal(IV) phosphates as solid acid catalysts for selective cyclodehydration of 1,n-diols
AUTHOR(S): Patel, Sonal M.; Chudasama, Uma V.; Ganeshpure, Pralhad A.
CORPORATE SOURCE: Applied Chemistry Department, Faculty of Technology and Engineering, M.S. University of Baroda, Vadodara, 390 001, India
SOURCE: Green Chemistry (2001), 3(3), 143-145
CODEN: GRCHFJ; ISSN: 1463-9262
PUBLISHER: Royal Society of Chemistry
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 136:167223

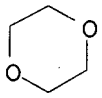
AB Metal(IV) phosphates of tin, zirconium, and titanium are applied, for the first time, as catalysts for selective cyclodehydration of butane-1,4-diol to THF in high yields. Tin(IV) phosphate showed highest activity amongst the three, and was used as a catalyst for cyclodehydration of various 1,n-diols. Cyclodehydration of butane-1,4-diol, pentane-1,5-diol, hexane-1,6-diol, and diethanolamine gave THF, tetrahydropyran, oxapane, and morpholine, resp. Cyclodehydration of diethylene glycol, triethylene glycol, diethylene glycol monomethyl ether, polyethylene glycol 200, and polyethylene glycol 300 gave 1,4-dioxane.

IT **13772-29-7**, Zirconium phosphate
RL: CAT (Catalyst use); USES (Uses)
(selective cyclodehydration of 1,n-diols catalyzed by metal(IV) phosphates)
RN 13772-29-7 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)



●1/2 Zr(IV)

IT **123-91-1P**, 1,4-Dioxane, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(selective cyclodehydration of 1,n-diols catalyzed by metal(IV) phosphates)
RN 123-91-1 HCAPLUS
CN 1,4-Dioxane (9CI) (CA INDEX NAME)



CC 27-1 (Heterocyclic Compounds (One Hetero Atom))
Section cross-reference(s): 28
IT **13772-29-7**, Zirconium phosphate 15142-98-0, Tin(IV) phosphate 17017-57-1, Titanium(IV) phosphate
RL: CAT (Catalyst use); USES (Uses)
(selective cyclodehydration of 1,n-diols catalyzed by metal(IV) phosphates)
IT 109-99-9P, THF, preparation 110-91-8P, Morpholine, preparation **123-91-1P**, 1,4-Dioxane, preparation 142-68-7P 592-90-5P, Oxepane
RL: SPN (Synthetic preparation); PREP (Preparation)
(selective cyclodehydration of 1,n-diols catalyzed by metal(IV) phosphates)
REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L52 ANSWER 10 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1998:352757 HCAPLUS
DOCUMENT NUMBER: 129:43150
TITLE: Dealuminized NU-86 zeolite and its use in the conversion of hydrocarbons
INVENTOR(S): Benazzi, Eric; Chouteau, Nicolas; Cauffriez, Herve
PATENT ASSIGNEE(S): Institut Francais du Petrole, Fr.; Benazzi, Eric; Chouteau, Nicolas; Cauffriez, Herve
SOURCE: PCT Int. Appl., 28 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

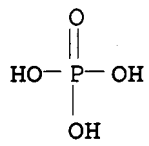
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9822213	A1	19980528	WO 1997-FR2021	199711 10
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW				
RW: GH, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
FR 2755958	A1	19980522	FR 1996-14187	199611 19
FR 2755958	B1	19990108		
CA 2271091	A1	19980528	CA 1997-2271091	199711

				10
AU 9851238	A	19980610	AU 1998-51238	199711 10
AU 735736	B2	20010712		
EP 939673	A1	19990908	EP 1997-945902	199711 10
R: BE, DE, ES, FR, GB, IT, NL				
CN 1242718	A	20000126	CN 1997-181153	199711 10
CN 1110365	B	20030604		
BR 9713100	A	20000328	BR 1997-13100	199711 10
JP 2001504079	T	20010327	JP 1998-523256	199711 10
NZ 335725	A	20010427	NZ 1997-335725	199711 10
RU 2184610	C2	20020710	RU 1999-112951	199711 10
US 6165439	A	20001226	US 1997-974427	199711 19
KR 2000053353	A	20000825	KR 1999-704379	199905 18
US 6337428	B1	20020108	US 2000-715074	200011 20
PRIORITY APPLN. INFO.:			FR 1996-14187 A	199611 19
			WO 1997-FR2021 W	199711 10
			US 1997-974427 A3	199711 19

AB The invention concerns a NU-86 zeolite, containing silicon, and at least one element T selected from the group formed by aluminum, iron, gallium and boron, preferably aluminum, characterized in that the element T was extracted from the structure and in that it has a global atomic Si/T greater than .apprx.20. The extraction of the element T from the zeolite structure (or network) is effected by at least a thermal treatment. optionally carried out in the presence of water vapor, followed by at least an acid attack, by at least a mineral or **organic** acid **solution**, or by a direct acid attack. The invention also concerns a catalyst comprising said zeolite at least partly in acid form and the use of said catalyst in hydrocarbon conversion, in particular in the oligomerization of olefins.

IT **13765-95-2**, Zirconium phosphate
RL: CAT (Catalyst use); USES (Uses)

(dealuminized NU-86 zeolite and its use in the conversion of hydrocarbons)
RN 13765-95-2 HCAPLUS
CN Phosphoric acid, zirconium salt (8CI, 9CI) (CA INDEX NAME)



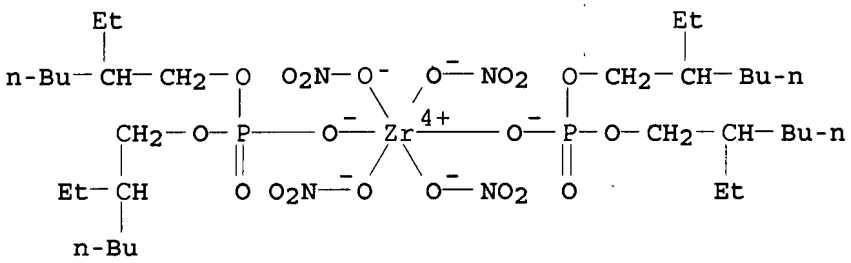
●x Zr(x)

IC ICM B01J029-70
ICS C01B039-02; C07C002-24
CC 51-6 (Fossil Fuels, Derivatives, and Related Products)
Section cross-reference(s): 67
IT 1303-86-2, Boria, uses 1309-48-4, Magnesia, uses 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7440-02-0, Nickel, uses 7440-06-4, Platinum, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-42-8, Boron, uses 7440-44-0, Carbon, uses 7440-55-3, Gallium, uses 7631-86-9, Silica, uses 7784-30-7, Aluminum phosphate 13463-67-7, Titania, uses 13765-94-1
13765-95-2, Zirconium phosphate
RL: CAT (Catalyst use); USES (Uses)
(dealuminized NU-86 zeolite and its use in the conversion of hydrocarbons)
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L52 ANSWER 11 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1995:47513 HCAPLUS
DOCUMENT NUMBER: 122:39953
TITLE: Mechanism for extraction of zirconium using di-2-ethylhexylphosphoric acid and TVEKS-di-2-ethylhexylphosphoric acid according to 31P-NMR spectroscopy data
AUTHOR(S): Korovin, V. Yu.; Randarevich, S. B.; Shestak, Yu. G.; Bodaratskii, S. V.; Trachevskii, V. V.
CORPORATE SOURCE: Nauchno Tsentr. "Sorbent", Ukraine
SOURCE: Zhurnal Neorganicheskoi Khimii (1994), 39(4), 666-9
CODEN: ZNOKAQ; ISSN: 0044-457X
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The extraction of Zr4+ from 2.2-8.1 M aqueous HNO3 using 0.3 or 1.875 M solns. of di-2-ethylhexylphosphoric acid (HA) in CCl4 and solid extractant containing HA (TVEKS-HA) was studied using 31P-NMR spectroscopy. Formation of the complexes Zr(NO3)4(HA)2 (I), ZrA(NO3)3(HA)2 (II) and ZrA2(NO3)2(HA)2 during the extraction by HA **solns.** in the **organic** phase was demonstrated. During the extraction of Zr by TVEKS-HA the complexes I and II were formed. The differences in the extraction of Zr by HA and TVEKS-HA are discussed.
IT **119921-02-7 119941-89-8**

RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)
(extraction of zirconium from aqueous HNO3 using diethylhexylphosphoric acid and TVEKS-diethylhexylphosphoric acid)

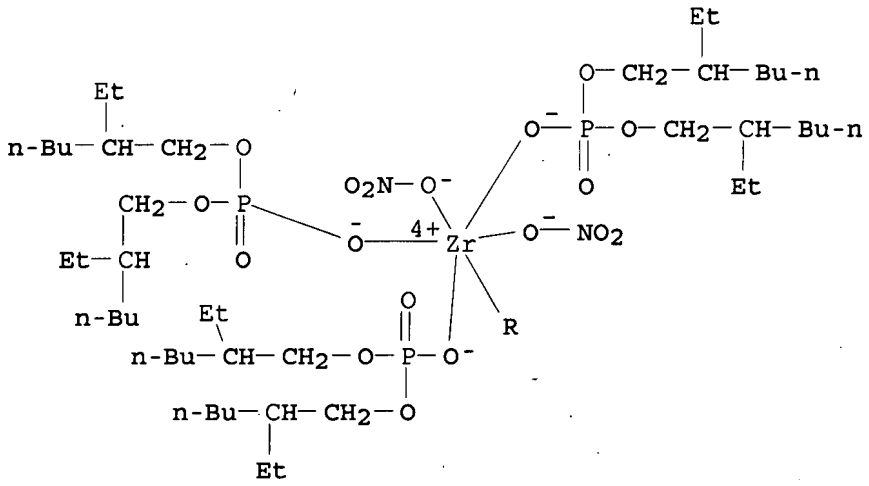
RN 119921-02-7 HCAPLUS
CN Zirconate(2-), bis[bis(2-ethylhexyl) phosphato-O'']tetrakis(nitrato-O)-, dihydrogen (9CI) (CA INDEX NAME)



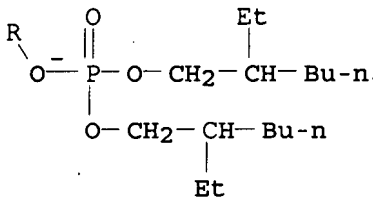
●2 H^+

RN 119941-89-8 HCAPLUS
CN Zirconate(2-), tetrakis[bis(2-ethylhexyl) phosphato-O'']bis(nitrato-O)-, dihydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



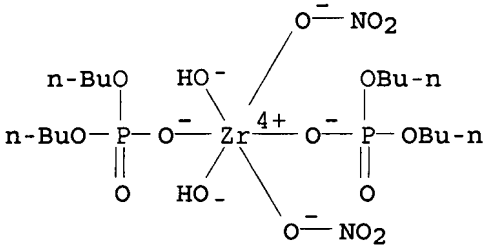
PAGE 2-A



●2 H^+

CC 68-2 (Phase Equilibriums, Chemical Equilibriums, and Solutions)
IT **119921-02-7 119941-89-8** 159984-82-4
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)
(extraction of zirconium from aqueous HNO3 using diethylhexylphosphoric acid and TVEKS-diethylhexylphosphoric acid)

L52 ANSWER 12 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1993:221581 HCAPLUS
DOCUMENT NUMBER: 118:221581
TITLE: "The third phase" of extraction processes in fuel reprocessing. (III). Phosphorus-31-NMR study of coordination behavior of zirconium dibutylphosphates
AUTHOR(S): Hirose, Mitsuhiro; Miyake, Chie; Iida, Masayasu
CORPORATE SOURCE: Dep. Nucl. Eng., Osaka Univ., Suita, 565, Japan
SOURCE: Journal of Nuclear Science and Technology (1993), 30(3), 232-8
CODEN: JNSTAX; ISSN: 0022-3131
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The coordination and complexation behavior of Zr-dibutylphosphate (HDBP) was investigated by 31P-NMR measurement, in order to clarify the mechanism of the previously reported phenomena that the ppts. once formed at low HDBP/Zr mole ratio of 2 in an **organic solution** disappears with increasing HDBP/Zr. As the results of 31P-NMR spectrum measurements, the following 2 steps were identified: (1) species having Zr:DBP = 1:3 immediately reacts with free HDBP to form species having Zr:DBP = 1:4 with increasing HDBP/Zr and (2) under the presence of higher HDBP/Zr concentration, species having more DBPs than 4 to one Zr are observed DBP- (or HDBP) ligands in these species bridge 2 Zr ions to form 3-dimensional net-work structure and have an interaction with HDBP in the solvent. Consequently, the mechanism was elucidated for the redissoln. of Zr-DBP ppts. with sufficient free HDBP producing highly viscous oily liquid
IT **126870-02-8P**
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in nuclear fuel reprocessing third phase extraction processes)
RN 126870-02-8 HCAPLUS
CN Zirconate(2-), bis(dibutyl phosphato-O'')dihydroxybis(nitrato-O)-, dihydrogen (9CI) (CA INDEX NAME)



●2 H^+

CC 71-5 (Nuclear Technology)
IT 107-66-4DP, Dibutylphosphate, zirconium complexes 7440-67-7DP, Zirconium, dibutylphosphate complexes **126870-02-8P**
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in nuclear fuel reprocessing third phase extraction processes)

L52 ANSWER 13 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1992:222326 HCAPLUS
DOCUMENT NUMBER: 116:222326
TITLE: Pillaring of layered compounds
INVENTOR(S): Clearfield, Abraham
PATENT ASSIGNEE(S): Texas A and M University, USA
SOURCE: U.S., 12 pp. Cont. of U.S. Ser. No. 142,731, abandoned.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5017537	A	19910521	US 1989-382059	19890714
US 5200378	A	19930406	US 1991-702804	19910520
PRIORITY APPLN. INFO.:			US 1988-142731 B1	19880111
			US 1989-382059 A1	19890714

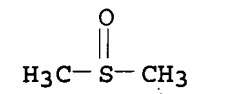
AB A process for pillaring layered materials, which do not swell appreciably in H2O, comprises 1st intercalating an amine or other neutral mol., such as an amide or DMSO, between the layers of the material to be pillared. This allows the subsequent incorporation of inorg. pillars which are more temperature stable than the intercalated

amine. Application for catalyst and adsorbents is indicated.

IT **67-68-5**, DMSO, uses
RL: USES (Uses)
(in preparation of pillared layered materials)

RN 67-68-5 HCAPLUS

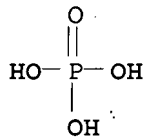
CN Methane, sulfinylbis- (9CI) (CA INDEX NAME)



IT **13772-29-7**, Zirconium phosphate
RL: USES (Uses)
(α- or γ-, pillaring of layered material of)

RN 13772-29-7 HCAPLUS

CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)



●1/2 Zr(IV)

IC ICM B01J029-04
ICS B01J029-06

INCL 502063000

CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 66, 78

IT **67-68-5**, DMSO, uses
RL: USES (Uses)
(in preparation of pillared layered materials)

IT 13765-94-1 **13772-29-7**, Zirconium phosphate
RL: USES (Uses)
(α- or γ-, pillaring of layered material of)

L52 ANSWER 14 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1992:189861 HCAPLUS

DOCUMENT NUMBER: 116:189861

TITLE: Intercalation and bilayer formation of phospholipids in γ-type layered transition metal phosphates

AUTHOR(S): Kanzaki, Yasushi; Abe, Mitsuo

CORPORATE SOURCE: Fac. Sci., Tokyo Inst. Technol., Tokyo, 152, Japan

SOURCE: Bulletin of the Chemical Society of Japan (1992), 65(1), 180-5
CODEN: BCSJA8; ISSN: 0009-2673

DOCUMENT TYPE: Journal

LANGUAGE: English

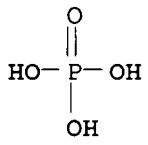
AB Intercalation of natural phospholipids, phosphatidylethanolamine

(PE) and phosphatidylcholine (PC), into inorg. layered compds. was examined in ethanol and chloroform solns. γ-Type titanium(IV) phosphate and zirconium(IV) phosphate were selected as host layered compds. They are strong solid acids and also known as inorg. ion exchangers. The intercalation of PE was propagated in chloroform solution in the presence of n-alkylamine, forming bilayers of PE-alkylamine mixture The direct reaction of PE with γ-phosphates was not successful. On the other hand, PC reacted directly with the layered compds. either in the chloroform or in the ethanol solution of PC and successfully formed bilayers.

IT **13772-31-1**
RL: BIOL (Biological study)
(phospholipids intercalation and bilayer formation in layers of, in **organic solns.** in amine presence or absence)

RN 13772-31-1 HCAPLUS

CN Phosphoric acid, zirconium(4+) salt (2:1), dihydrate (8CI, 9CI) (CA INDEX NAME)



● H_2O

●1/2 Zr(IV)

CC 6-6 (General Biochemistry)

IT Phosphatidylcholines, biological studies
Phosphatidylethanolamines
RL: BIOL (Biological study)
(intercalation and bilayer formation of, in γ-type layered transition metal phosphates in **organic solns.** in amine presence)

IT Membrane, biological
(bilayer, phospholipid, formation of, in γ-type layered transition metal phosphates in **organic solution** in amine presence or absence)

IT Molecular association
(intercalation, of phospholipids, in γ-type layer transition metal phosphates in **organic solution** in amine presence or absence)

IT **13772-31-1** 14635-14-4
RL: BIOL (Biological study)
(phospholipids intercalation and bilayer formation in layers of, in **organic solns.** in amine presence or absence)

L52 ANSWER 15 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1990:554357 HCAPLUS
DOCUMENT NUMBER: 113:154357
TITLE: Modified copper powders, their manufacture, and electrically conductive compositions containing

them
INVENTOR(S): Mito, Kentaro; Senzaki, Hirohisa; Hayashi, Hisao
PATENT ASSIGNEE(S): Mitsui Mining and Smelting Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

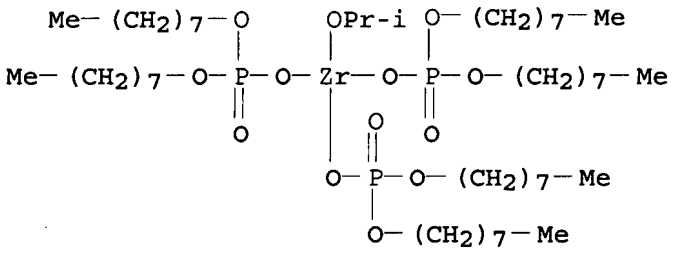
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 02107672	A	19900419	JP 1988-262068	19881018

PRIORITY APPLN. INFO.: JP 1988-262068 19881018

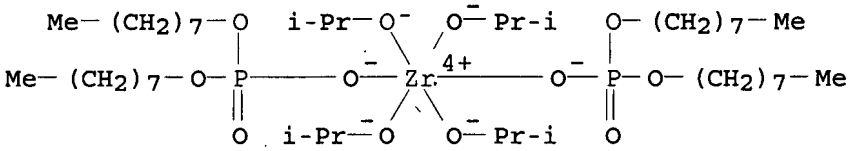
AB Conductive coatings contain modified Cu powders prepared by treating with higher fatty acid **solns.**, then with **organic** zirconates in nonsolvent systems, or contain higher fatty acid-modified Cu powders and organic zirconates. Thus, soaking MF D2 (Cu powder) in a 0.01-10.0% solution of caproic acid for10-60 min, drying, and mixing with 0.01-10% of the reaction product of 3 mol isostearic acid and 1 mol tetraisopropoxyzirconium gave a product with good discoloration resistance after 103 h at 60° and 95% relative humidity. Acrylic coatings containing the modified Cu powders showed resistivity 1 + 10-4-3 + 10-4 Ω-cm, with good heat and moisture resistance.

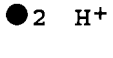
IT **109551-04-4 129614-35-3**
RL: USES (Uses)
(copper powder treated with fatty acids and, storage-stable, for elec. conductive coatings)

RN 109551-04-4 HCAPLUS
CN Zirconium, tris(dioctyl phosphato-κO'')(2-propanolato)-, (T-4)- (9CI) (CA INDEX NAME)



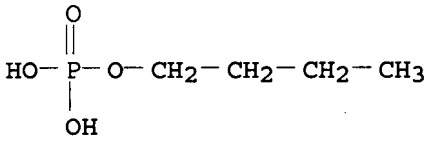
RN 129614-35-3 HCAPLUS
CN Zirconate(2-), bis(dioctyl phosphato-O'')tetrakis(2-propanolato)-, dihydrogen (9CI) (CA INDEX NAME)





IC ICM C09C001-62
ICS C09D005-24
CC 42-5 (Coatings, Inks, and Related Products)
Section cross-reference(s): 56, 76
IT **109551-04-4** 117753-51-2 125210-92-6, Isopropyl trioctanoyl zirconate 125275-51-6, Isopropoxyzirconium triisostearate 125275-52-7 125275-53-8, Isopropyl isostearoyl diacryloyl zirconate 125275-54-9, Diisostearoyl ethylene zirconate 125275-55-0, Butyl triisostearoyl zirconate 125275-67-4 125467-62-1 125615-78-3 125669-88-7 125694-82-8, Bis(dioctyl pyrophosphato) ethylene zirconate 127244-46-6 127277-79-6, Isopropyl tris(cumylphenyl) zirconate 127282-42-2 127324-14-5, Isopropoxyzirconium trioleate 129026-61-5, Butyl trioleyl zirconate **129614-35-3** 129747-98-4, Butoxyzirconium tripalmitate 129747-99-5, Butoxyzirconium trilaurate 129748-01-2 129748-03-4 129822-28-2 129822-29-3, Pentoxyzirconium tristearate 129822-30-6
RL: USES (Uses)
(copper powder treated with fatty acids and, storage-stable, for elec. conductive coatings)

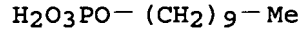
L52 ANSWER 16 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1989:146510 HCAPLUS
DOCUMENT NUMBER: 110:146510
TITLE: Preparation and properties of some plutonium(IV) and zirconium monoalkyl phosphates
AUTHOR(S): Kostrova, A. M.; Moshkov, M. M.; Markov, G. S.; Andreev, V. I.
CORPORATE SOURCE: USSR
SOURCE: Radiokhimiya (1988), 30(6), 739-46
CODEN: RADKAU; ISSN: 0033-8311
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB (RO)PO3H2 (R = Bu, hexyl, octyl, decyl) reacted with Pu(IV) or Zr(IV) in **organic** or aqueous **solns.** in the Bu3PO4-dodecane-HNO3-H2O extraction system. to form Pu(O3POR)2, Pu(NO3)2(HO3POR1)2 (R1 = Bu, hexyl) and Zr(O3POR2)2.nH2O (R2 = Bu, decyl). These salts were characterized by spectral and solubility studies in the organic and aqueous phases. The reaction conditions for the formation of these salts were determined
IT **71159-44-9P 119688-63-0P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and IR spectrum and solubility of)
RN 71159-44-9 HCAPLUS
CN Phosphoric acid, monobutyl ester, zirconium(4+) salt (2:1), monohydrate (9CI) (CA INDEX NAME)



●1/2 H_2O

●1/2 Zr(IV)

RN 119688-63-0 HCAPLUS
CN Phosphoric acid, monodecyl ester, zirconium(4+) salt (2:1) (9CI) (CA INDEX NAME)

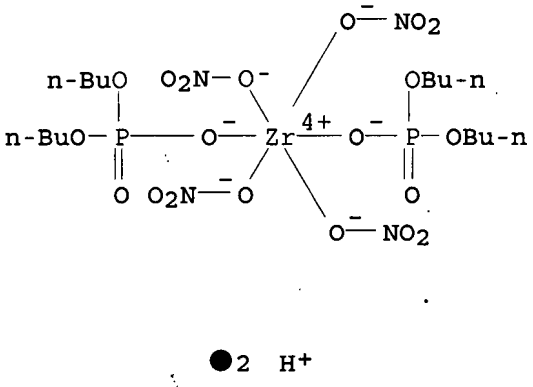


●1/2 Zr(IV)

CC 78-5 (Inorganic Chemicals and Reactions)
IT **71159-44-9P 119688-63-0P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and IR spectrum and solubility of)

L52 ANSWER 17 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1989:47562 HCAPLUS
DOCUMENT NUMBER: 110:47562
TITLE: Infrared study of zirconium nitrate in 30% TBP-kerosine solution
AUTHOR(S): Yu, Yufu; Zhou, Yakang; Qin, Qizong
CORPORATE SOURCE: Dep. Nucl. Sci., Fudan Univ., Shanghai, Peop. Rep. China
SOURCE: Fudan Xuebao, Ziran Kexueban (1988), 27(1), 38-44
CODEN: FHPTAY; ISSN: 0427-7104
DOCUMENT TYPE: Journal
LANGUAGE: Chinese
AB The Fourier transform IR spectra of the systems of 30% TBP-kerosine, 30% TBP-kerosine-HNO3, 30% TBP-kerosine-Zr(NO3)4, Zr(NO3)4(DBP)2 (DBP - dibutyl phosphate), and an organic complex at 250-2000 cm-1 are presented along with the assignment of the main components of the spectra to the functional groups. The effect of aging on the IR spectra of 30% TBP-kerosine-Zr(NO3)4 was examined During 3 mo of aging no new absorption bands developed in the Zr-TBP-kerosine solution Zr precipitated from aged **organic solution** exhibited an IR spectrum almost identical with the spectrum of Zr nitrate DBP complex.
IT **118370-84-6**
RL: PRP (Properties)
(IR spectra of)

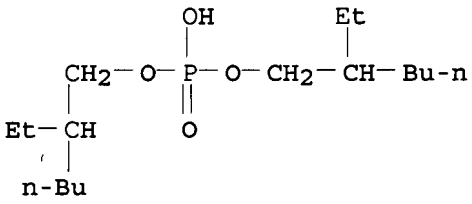
RN 118370-84-6 HCAPLUS
CN Zirconate(2-), bis(dibutyl phosphato-O'')tetrakis(nitrato-O)-, dihydrogen (9CI) (CA INDEX NAME)



●2 H+

CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 71
IT **118370-84-6**
RL: PRP (Properties)
(IR spectra of)

L52 ANSWER 18 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1988:86859 HCAPLUS
DOCUMENT NUMBER: 108:86859
TITLE: Oxidative properties of solutions of potassium permanganate in tributyl phosphate
AUTHOR(S): Kovaleva, T. V.; Legin, E. K.; Khokhlov, M. L.; Suglobov, D. N.
CORPORATE SOURCE: Radiev. Inst. im. Khlopina, Leningrad, USSR
SOURCE: Zhurnal Neorganicheskoi Khimii (1987), 32(10), 2448-53
CODEN: ZNOKAQ; ISSN: 0044-457X
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB KMnO4 in TBP exists as KMnO4.3TBP. Oxidation studies of Ce(III), Mn(II) and primary alcs. by KMnO4 in TBP indicate that such solns. can be effectively used for redox reactions in nonaq. media and, in particular, exts. Stable **organic solns.** of Mn(III) and Mn(IV) were obtained. Reduction of KMnO4 in nonaq. media led to the formation of polymanganites(IV).
IT **100477-70-1**
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of cerium in, by potassium permanganate in tri-Bu phosphate)
RN 100477-70-1 HCAPLUS
CN Phosphoric acid, bis(2-ethylhexyl) ester, cerium(3+) salt (9CI) (CA INDEX NAME)

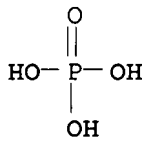


●1/3 Ce(III)

CC 78-9 (Inorganic Chemicals and Reactions)
IT **100477-70-1**
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of cerium in, by potassium permanganate in tri-Bu phosphate)

L52 ANSWER 19 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1987:575286 HCAPLUS
DOCUMENT NUMBER: 107:175286
TITLE: A Fourier-transform Infrared and catalytic study of the evolution of the surface acidity of zirconium phosphate following heat treatment
AUTHOR(S): Busca, Guido; Lorenzelli, Vincenzo; Galli, Paola; La Ginestra, Aldo; Patrono, Pasquale
CORPORATE SOURCE: Fac. Ing., Univ. Fiera del Mare, Genova, 16129, Italy
SOURCE: Journal of the Chemical Society, Faraday Transactions 1: Physical Chemistry in Condensed Phases (1987), 83(3), 853-64
CODEN: JCFTAR; ISSN: 0300-9599
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The surface acidity of zirconium phosphate at different stages of dehydration and heat treatments has been studied by the Fourier-transform IR of adsorbed pyridine, acetonitrile, and acetone and by catalytic activity in the isomerization of 1-butene. Broensted-acidic surface POH and P(OH)2 groups are identified [ν(OH) : 3670-3660 and 3600 cm-1, resp.] whose strength increases slightly on bulk dehydration. They are thought to be responsible for the activity in 1-butene isomerization, which also increases during condensation to pyrophosphate. Lewis-acidic sites of medium-high strength have also been found, and responsible for the formation of chemisorbed forms of pyridine (ν8a : 1610 cm-1), acetonitrile [ν(CN) Fermi resonance doublet at 2322 and 2295 cm-1] and acetone [ν(CO) 1684 cm-1]. Surface Zr OH groups are also detected on the layered ZrP2O7 surface. The results illustrate the role of exposed planes, both parallel and perpendicular to the layered structure.
IT **75-05-8**, Acetonitrile, properties
RL: PRP (Properties)
(absorption of, on zirconium phosphate, effect of calcination temperature on)
RN 75-05-8 HCAPLUS
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

IT **13772-29-7**
RL: PRP (Properties)
(chemisorption of pyridine, of acetonitrile, or acetone on, effect of heat treatment on)
RN 13772-29-7 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)



●1/2 Zr(IV)

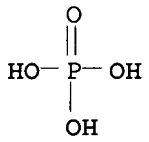
CC 22-6 (Physical Organic Chemistry)
Section cross-reference(s): 67
IT 67-64-1, Acetone, properties **75-05-8**, Acetonitrile, properties 110-86-1, Pyridine, properties
RL: PRP (Properties)
(absorption of, on zirconium phosphate, effect of calcination temperature on)
IT **13772-29-7**
RL: PRP (Properties)
(chemisorption of pyridine, of acetonitrile, or acetone on, effect of heat treatment on)

L52 ANSWER 20 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1984:464231 HCAPLUS
DOCUMENT NUMBER: 101:64231
TITLE: Sodium(1+) and lithium(1+) NASICON superionic conductors thick films
AUTHOR(S): Perthuis, H.; Velasco, G.; Colomban, P.
CORPORATE SOURCE: Lab. Phys. Chim. Dispositifs Ion., Thomson-CSF, Orsay, 91401, Fr.
SOURCE: Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers (1984), 23(5), 534-43
CODEN: JAPNDE
DOCUMENT TYPE: Journal
LANGUAGE: English
AB For microionic applications, superionic conductors were elaborated in the form of thick films, by using silk-screen printable powders. Na3Zr2Si2PO12, Na3.1Zr1.55Si2.3P0.7O11 and Li0.8Zr1.8Ta0.2(PO4)3 compns. were synthesized by a sol-gel process involving hydrolysis-polycondensation reactions of metal-**organic** alc. **solns.** A thermal treatment (600-800°) allows one to obtain very fine particles (<1 μm) with the pure NASICON phase. Inks were prepared with these powders, an organic binder, volatile fluidifying agents and mineralizers. The layers, about 50 μm in thickness, were achieved by successive deposits and sinterings (950-1050°) onto alumina substrates. Film conductivity was determined by

using the complex impedance method. Values measured at 300° (Na+: conductivity σ .apprx.10-2 Ω-1cm-1, activation energy EA = 0.25 eV, Li+: σ .apprx.5 + 10-4 Ω-1cm-1, EA = 0.5 eV) reach those obtained with well-densified ceramics. An anisotropic behavior related to microstructure is pointed out.

IT **19286-99-8D**, solid solns. with sodium zirconium silicate **91173-98-7**
RL: USES (Uses)
(superionic conductors from thick films of)

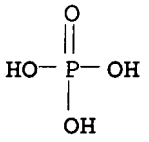
RN 19286-99-8 HCAPLUS
CN Phosphoric acid, sodium zirconium(4+) salt (8CI, 9CI) (CA INDEX NAME)



●x Na

●x Zr(IV)

RN 91173-98-7 HCAPLUS
CN Phosphoric acid, lithium tantalum(5+) zirconium(4+) salt (9CI) (CA INDEX NAME)



●x Li

●x Ta(V)

●x Zr(IV)

CC 76-2 (Electric Phenomena)
IT 12738-56-6D, solid solns. with sodium zirconium phosphate
19286-99-8D, solid solns. with sodium zirconium silicate
58572-20-6 **91173-98-7**

RL: USES (Uses)
(superionic conductors from thick films of)

L52 ANSWER 21 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1984:412533 HCAPLUS
DOCUMENT NUMBER: 101:12533
TITLE: Synthesizing a multicomponent acidic catalyst composition containing zirconium by an **organic solution** method
INVENTOR(S): Ryu, Ji Yong
PATENT ASSIGNEE(S): Exxon Research and Engineering Co. , USA
SOURCE: U.S., 15 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4444904	A	19840424	US 1983-498516	19830526
CA 1205449	A1	19860603	CA 1983-438647	19831007
EP 126194	A1	19841128	EP 1983-306148	19831011
R: BE, DE, FR, GB, NL				
JP 59222235	A	19841213	JP 1983-205731	19831101
US 4739111	A	19880419	US 1985-774895	19850911

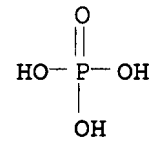
PRIORITY APPLN. INFO.: US 1983-498516 A 19830526
US 1983-561322 A1 19831214

OTHER SOURCE(S): CASREACT 101:12533; MARPAT 101:12533
AB A catalyst for preparing α, β-unsatd acids, their derivs., or olefinic O-containing compds. is prepared by reacting a mixture containing ≥1 Al(OR)3 (R = alkyl, aryl, aralkyl, alkaryl, and cycloalkyl with ether and/or ester substituents), ≥1 Zr(OR)4, ≥1 P oxide acid, H2O, and ≥1 organic liquid selected from aldehydes, ketones, or ethers in such a way that the Al(OR)3 and Zr(OR)4 react with the P oxide acid before contacting the H2O, separating the products, and calcining at 600-1300°. Thus, Zr(OBu)4.BuOH 131.6 was dissolved with Al(O-sec-Bu)3 128.1 and (EtO)4Si 49.68 in Et2O 908 g and acetone 500 cm3 added after stirring to form solution A. Then, 85% H3PO4 50.2, H2O 26.69 g, and acetone 250° cm3 were mixed to form B which was added to A over 8.5 h. The mixture was aged overnight, refluxed for 2.5 h, and filtered to give a product which was calcined 1st at 460° for 1 h and 520° for 4.5 h.

The product was powdered, mixed with H2O-soluble starch, and pelletized to give a catalyst which with a feed of 10% methylal and 90% Me propionate give a 100% conversion of methylal and a 45% yield of Me methacrylate and methacrylic acid.

IT **13765-95-2**
RL: CAT (Catalyst use); USES (Uses)
(catalyst containing, for unsatd. carboxylic acid synthesis)

RN 13765-95-2 HCAPLUS
CN Phosphoric acid, zirconium salt (8CI, 9CI) (CA INDEX NAME)



●x Zr(x)

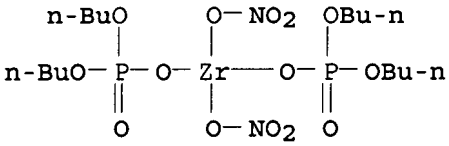
IC B01J027-14; B01J021-02; B01J031-12
INCL 502208000
CC 65-1 (General Physical Chemistry)
Section cross-reference(s): 24
IT 13308-51-5 **13765-95-2**
RL: CAT (Catalyst use); USES (Uses)
(catalyst containing, for unsatd. carboxylic acid synthesis)

L52 ANSWER 22 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1981:9431 HCAPLUS
DOCUMENT NUMBER: 94:9431
TITLE: An infrared study of zirconium retention in 30% tributyl phosphate
AUTHOR(S): Meisenhelder, J. H.; Siczek, A. A.
CORPORATE SOURCE: Argonne Natl. Lab., Argonne, IL, 60439, USA
SOURCE: Radiochimica Acta (1980), 27(4), 223-7
CODEN: RAACAP; ISSN: 0033-8230
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The retention of Zr in 30% Bu3PO4/n-dodecane as a function of the age of Zr **organic solns.** was studied by observing spectra in the IR region of 3700 cm-1 to 220 cm-1. Fourier transform IR spectra of the system Zr/HNO3/Bu3PO4/n-dodecane and its components are presented along with assignment of the functional groups. During 4 mo of aging, no new absorption bands developed in the spectra of Zr/Bu3PO4/n-dodecane solns. Zr that precipitated from aged **organic solns.** exhibited an IR spectrum that was almost identical with the spectrum of Zr nitrate-dibutyl phosphate.

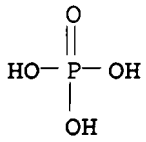
IT **25741-57-5**
RL: PRP (Properties)
(IR spectrum of)

RN 25741-57-5 HCAPLUS
CN Zirconium, bis(dibutyl phosphato-O'')bis(nitrato-O)-, (T-4)- (9CI) (CA INDEX NAME)



CC 73-3 (Spectra by Absorption, Emission, Reflection, or Magnetic Resonance, and Other Optical Properties)
Section cross-reference(s): 68, 71
IT **25741-57-5**
RL: PRP (Properties)
(IR spectrum of)

L52 ANSWER 23 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1980:454681 HCAPLUS
DOCUMENT NUMBER: 93:54681
TITLE: Sorption of ruthenium-106 and zirconium-95 from purex solvent on organic and inorganic ion exchangers
AUTHOR(S): Turcanu, C. N.; Radu, D.
CORPORATE SOURCE: Inst. Nucl. Power React., Bucharest, Rom.
SOURCE: Radiochemical and Radioanalytical Letters (1980), 43(4), 245-54
CODEN: RRALAZ; ISSN: 0079-9483
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The removal of 106Ru and 95Zr from degraded 30% TBP-dodecane system, by ion-exchange resins (Dowex 1-X8, Dowex 50 W-X8, IRA-400, CS-3, CS-32, CC-11, AS-13, AT-1)/ and inorg. ion exchangers (Fe(III)hydroxide, Al hydroxide and ammonium diuranate microspheres; Mn(IV) hydroxide, uranyl and Al phosphates; Zr(IV), Sn(II), Ti(IV) hydroxide and phosphates) was studied.
IT **13765-95-2**
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(sorption by, of ruthenium-106 and zirconium-95 from TBP dodecane mixts.)
RN 13765-95-2 HCAPLUS
CN Phosphoric acid, zirconium salt (8CI, 9CI) (CA INDEX NAME)



●x Zr(x)

CC 66-4 (Surface Chemistry and Colloids)
Section cross-reference(s): 71
IT Ion exchange
(of ruthenium-106 and zirconium-95, from TBP-dodecane **solns.** by **organic** and inorg. exchangers)
IT 1309-33-7 7783-22-4 7784-30-7 12026-24-3 12626-88-9
12651-23-9 12688-15-2 **13765-95-2** 14417-93-7

18433-48-2 21645-51-2, properties
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(sorption by, of ruthenium-106 and zirconium-95 from TBP dodecane mixts.)

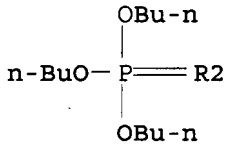
L52 ANSWER 24 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1968:510455 HCAPLUS
DOCUMENT NUMBER: 69:110455
TITLE: Extraction of rare earths with tributyl phosphate
AUTHOR(S): Genov, L.; Zakharieva, M.
CORPORATE SOURCE: Chem.-Technol. Inst., Sofia-Darvenitsa, Bulg.
SOURCE: Monatshefte fuer Chemie (1968), 99(5), 1976-81
CODEN: MOCHAP
DOCUMENT TYPE: Journal
LANGUAGE: German

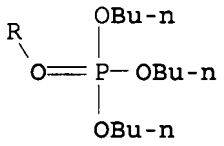
AB The extraction of Gd(NO3)3 and Yb(NO3)3 with Bu3PO4 has been studied as a function of the nitrate ion concentration The metalnitrate ion complex stability consts. in aqueous solution have been determined From the ir spectra of Ce(NO3)3·3Bu3PO4, Pr(NO3)3·3Bu3PO4, Gd(NO3)3·3Bu3PO4, Yb(NO3)3·3Bu3PO4, and Lu(NO3)3·3Bu3PO4 a decrease of the strength of the metal-phosphoryl O bond with increasing atomic number was deduced. Comparison of the results of complex formation in aqueous solution with those of complex stability in **organic solution** provides a possibility of explaining the maximum in the distribution coefficient/atomic number curve found at low acidities.

IT **14930-63-3**
RL: PRP (Properties)
(spectrum (ir) of)

RN 14930-63-3 HCAPLUS
CN Cerium, tris(nitrato-κO)tris(tributyl phosphate-κO''')-(9CI) (CA INDEX NAME)

PAGE 1-A





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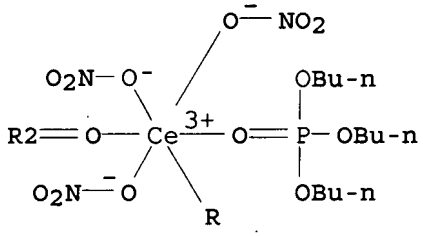
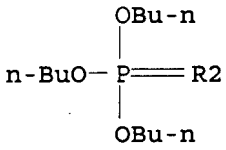
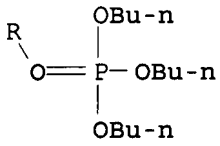


CC 68 (Phase Equilibriums, Chemical Equilibriums, and Solutions)
IT **14930-63-3** 14930-64-4 14951-87-2
RL: PRP (Properties)
(spectrum (ir) of)

L52 ANSWER 25 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1966:486031 HCAPLUS
DOCUMENT NUMBER: 65:86031
ORIGINAL REFERENCE NO.: 65:16125c-e
TITLE: Effect of the composition of organophosphorus compounds on the extraction of Ce(III) nitrate
AUTHOR(S): Orlov, Yu. F.; Shvedov, V. P.
SOURCE: Radiokhimiya (1966), 8(2), 139-45
CODEN: RADKAU; ISSN: 0033-8311
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB In the extraction of Ce(III) from 0.05-2.0M HNO3 solns. by **solns**. of various **organic** P compds. in C6H6 at 25° the extraction consts. K are: by bis(2-ethylhexyl) phenylphosphonate 66, by DAMPA [MeP(O)(OC5H11-iso)2] 66, by DBPPA [PrP(O)(OBu)2] 36, by DBOBPA [AcCH2CH2P(O)(OBu)2] 34, by DBAPA [CH2:CHCH2P(O)(OBu)2] 18, by DBHPA [C6H13P(O)(OBu)2] 17, by DBMAPA [MeC.tplbond.CP(O)(OBu)2] 0.28, by DBEPA [EtO2CCH2CH(CO2Et)P(O)(OBu)2] 0.10, by TCHP [(cyclo-C6H11O)3PO] 1.3, by Bu3PO4 1.0, by triamyl phosphate 1.0, by TSBP [(sec-BuO)3PO] 0.15, by DBPP [(BuO)2(PhO)PO] 0.0084, by DPBP [(BuO)(PhO)2PO] 0.000047. In all cases the Ce(III) was extracted as Ce(NO3)3.3S, where S is the organophosphorus mol. In the extraction by C6H6 solns. of trihexyl phosphate the Ce was extracted as Ce(NO3)3.2S. The extraction of Ce is affected mainly by the inductive (polar) effect of the substituents in the organophosphorus mol., and to a lesser extent by steric factors; the dependence of log K on the oscillation frequency of the P: O bond is only approx. linear.
IT **14930-63-3P**, Cerium, trinitratotris(tributyl phosphate)- **15664-83-2P**, Cerium, trinitratotris(triphenyl phosphate)- **15694-94-7P**, Cerium, trinitratotris(butyl diphenyl phosphate)- **15707-70-7P**, Cerium, trinitratobis(trihexyl phosphate)- **15818-96-9P**, Cerium, trinitratotris(dibutyl phenyl phosphate)- **15906-45-3P**, Cerium, trinitratotris(tricyclohexyl phosphate)-
RL: PREP (Preparation)
(extraction of)
RN 14930-63-3 HCAPLUS
CN Cerium, tris(nitrato-κO)tris(tributyl phosphate-κO''')-(9CI) (CA INDEX NAME)

PAGE 1-A





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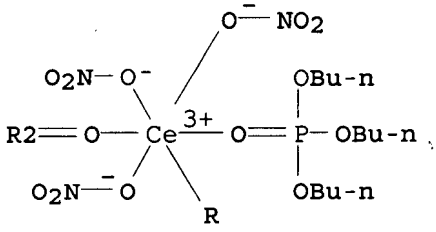
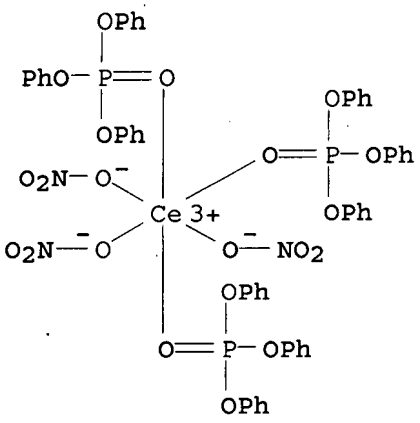
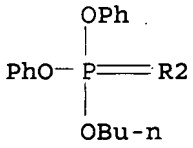


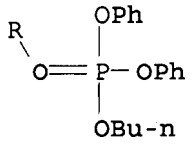
RN 15664-83-2 HCAPLUS
CN Cerium, tris(nitrato-O)tris(triphenyl phosphate-O''')- (9CI) (CA INDEX NAME)



RN 15694-94-7 HCAPLUS
CN Cerium, tris(butyl diphenyl phosphate-O''')tris(nitrato-O)- (9CI) (CA INDEX NAME)

PAGE 1-A





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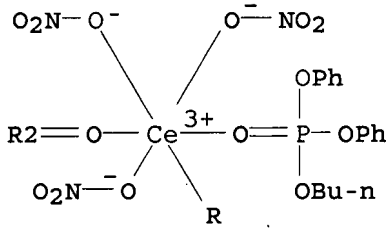
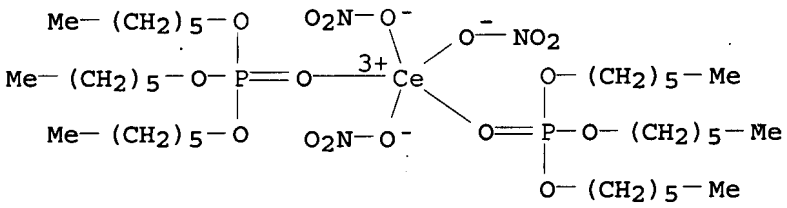
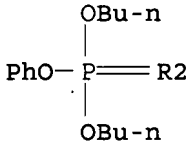


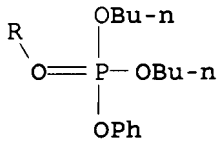
RN 15707-70-7 HCAPLUS
CN Cerium, tris(nitrato-O)bis(trihexyl phosphate-O''')- (9CI) (CA INDEX NAME)



RN 15818-96-9 HCAPLUS
CN Cerium, tris(dibutyl phenyl phosphate-O''')tris(nitrato-O)- (9CI) (CA INDEX NAME)

PAGE 1-A





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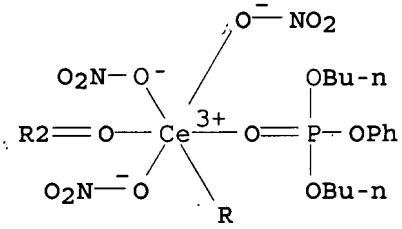
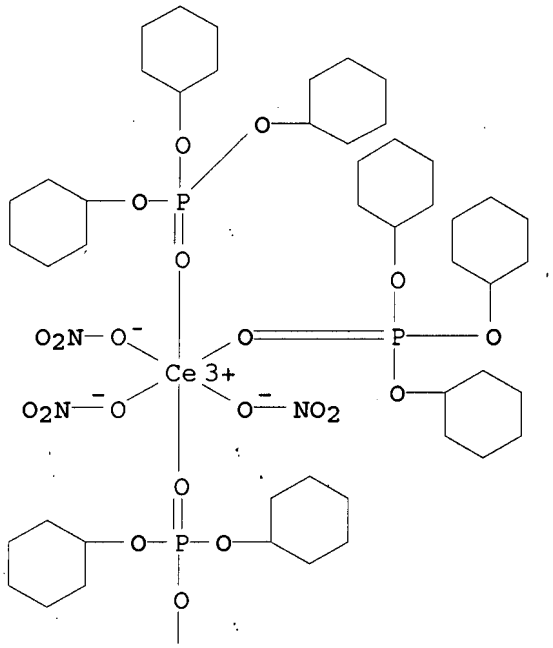


RN 15906-45-3 HCAPLUS
CN Cerium, tris(nitrato-O)tris(tricyclohexyl phosphate-O''')- (9CI) (CA INDEX NAME)

PAGE 1-A



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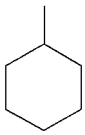
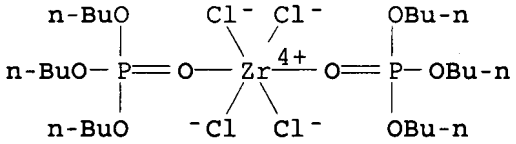


CC 6 (Phase Equilibriums, Chemical Equilbriums, and Solutions)
IT **14930-63-3P**, Cerium, trinitratotris(tributyl phosphate)-
15614-33-2P, Cerium, trinitratotris(methylphosphonic acid)-,
hexaisopentyl ester **15664-83-2P**, Cerium,
trinitratotris(triphenyl phosphate)- **15694-94-7P**, Cerium,
trinitratotris(butyl diphenyl phosphate)- **15707-70-7P**,
Cerium, trinitratobis(trihexyl phosphate)- 15818-89-0P, Cerium,
trinitratotris(phenylphosphonic acid)-, hexakis(2-ethylhexyl ester)
15818-90-3P, Cerium, trinitratotris[(3-oxobutyl)phosphonic acid]-,
hexabutyl ester 15818-91-4P, Cerium, trinitratotris(allylphosphoni
c acid)-, hexabutyl ester 15818-92-5P, Cerium,
trinitratotris(1-propynylphosphonic acid)-, hexabutyl ester
15818-93-6P, Cerium, trinitratotris(phosphonosuccinic acid)-,
P,P,P',P',P'',P''-hexabutyl hexa-Et ester **15818-96-9P**,
Cerium, trinitratotris(dibutyl phenyl phosphate)- 15906-44-2P,
Cerium, trinitratotris(hexylphosphonic acid)-, hexabutyl ester
15906-45-3P, Cerium, trinitratotris(tricyclohexyl
phosphate)- 108986-02-3P, Cerium, trinitratotris(tri-sec-butyl
phosphate)-
RL: PREP (Preparation)
(extraction of)

L52 ANSWER 26 OF 26 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1965:468955 HCAPLUS
DOCUMENT NUMBER: 63:68955
ORIGINAL REFERENCE NO.: 63:12647g-h
TITLE: Dielectric method for studying tributylphosphate complexes in dilute **organic solutions**
AUTHOR(S): Schaarschmidt, K.; Mende, G.
CORPORATE SOURCE: Tech. Univ., Dresden, Germany
SOURCE: Theory and Structure of Complex Compounds, Papers Presented at the Symposium (1964), Volume Date 1962 665-8
CODEN: 14RFAD
DOCUMENT TYPE: Journal
LANGUAGE: German

AB The dielec. constant ε of dilute solns. of a polar substance B (mole fraction xB in the range of 10-2) in a nonpolar solvent is generally a linear function of xB. The slope aB = Δε/ΔxB is characteristic of the substance in this solvent; the same slope is found, if a polar substance A (xA also in the range of 10-2) is added to the same solvent, provided that no interactions occur between A and B. If complexes are formed between A and B, dielec. measurements may be used for studying the molar ratio, the completeness of the reaction, and the dipole moment of the complexes formed. It is not necessary to isolate the complexes. The method was tested for complexes of tributylphosphate with COCl2, ZnCl2, and HCl. The dielec. measurements were supported by cryoscopic and spectrophotometric measurements.

IT **18078-23-4**, Zirconium, tetrachlorobis(tributyl phosphate)-
(dielec. study of)
RN 18078-23-4 HCAPLUS
CN Zirconium, tetrachlorobis(tributyl phosphate-O''')- (9CI) (CA INDEX NAME)

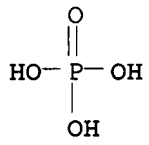


CC 14 (Inorganic Chemicals and Reactions)
IT Dielectric constant, Dielectric dispersion
(of butyl phosphate [(BuO)3PO] complexes in **organic solns.**)
IT Butyl phosphate, (BuO)3PO, cerium complex
RL: PREP (Preparation)
(complexes of, formation in **organic solns.**, dielec. study of)
IT 2237-41-4, Butyl phosphate, (BuO)3PO, compound with HCl (1:1)
2237-41-4, Hydrochloric acid, compound with (BuO)3PO (1:1)
14645-06-8, Cobalt, dichlorobis(tributyl phosphate)- 14645-07-9, Zinc, dichlorobis(tributyl phosphate)- 14705-66-9, Zinc, tetrachlorobis(tributyl phosphate)di- **18078-23-4**, Zirconium, tetrachlorobis(tributyl phosphate)-
(dielec. study of)

=>

```
=> d his l53-

     FILE 'REGISTRY' ENTERED AT 13:40:23 ON 28 FEB 2007
L53             1 S 84057-80-7/RN
L54             1 S 13520-92-8/RN

     FILE 'HCAPLUS' ENTERED AT 13:41:36 ON 28 FEB 2007
L55           376 S L53 OR L54
L56            28 S L55 AND L36
L57             0 S L51 AND L55
L58             1 S L52 AND L55
L59            27 S L56 NOT (L51 OR L52)
                  SEL HIT RN L59
L60             0 S L59 AND L42


=> d l59 ibib abs hitstr hitind 1-27

L59  ANSWER 1 OF 27  HCAPLUS  COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER:         2005:1220042  HCAPLUS
DOCUMENT NUMBER:          144:139271
TITLE:                    Room Temperature Crystal Structure of
                          La1/3Zr2(PO4)3, a NASICON-type Compound
AUTHOR(S):                Barre, M.; Crosnier-Lopez, M. P.; Le Berre, F.;
                          Emery, J.; Suard, E.; Fourquet, J.-L.
CORPORATE SOURCE:         Laboratoire des Oxydes et Fluorures (UMR CNRS
                          6010), Laboratoire de Physique de l'Etat
                          Condense (UMR CNRS 6087), and Institut de
                          Recherche en Ingenierie Moleculaire et Materiaux
                          Fonctionnels (FR CNRS 2575), Faculte des
                          Sciences et Techniques, Universite du Maine, Le
                          Mans, 72085, Fr.
SOURCE:                   Chemistry of Materials (2005), 17(26), 6605-6610
                          CODEN: CMATEX; ISSN: 0897-4756
PUBLISHER:                American Chemical Society
DOCUMENT TYPE:            Journal
LANGUAGE:                 English
AB   The room-temperature crystal structure of La1/3Zr2(PO4)3, synthesized by
     the Pechini sol-gel process, was determined from x-ray powder and neutron
     diffraction data [space group P.hivin.3, Z = 6, a 8.7378(2), c
     23.2156(7) Å]. Crystallog. data and atomic coordinates are given.
     It derives from the NASICON-structural type (space group
     R.hivin.3c); if the [Zr2(PO4)3]- network is preserved, the two La3+
     ions are found quasiordered along the c axis: 1 on the 1a (0, 0, 0),
     0.82 on the 1b (0, 0, 1/2) sites, and the remaining 0.18 La3+ ions
     occupying partially a 2d site (1/3, 2/3, 0.667(5)). One and two
     dimensional 31P NMR (1-dimensional and 2-dimensional, resp.) studies
     confirm this distribution.
IT   156571-92-5P
     RL: PRP (Properties); SPN (Synthetic preparation); PREP
     (Preparation)
        (preparation and crystal structure of)
RN   156571-92-5  HCAPLUS
CN   Phosphoric acid, lanthanum(3+) zirconium(4+) salt (9:1:6) (9CI)  (CA
     INDEX NAME)
```

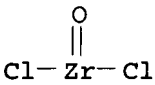
claim 4 compounds



●1/9 La(III)

●2/3 Zr(IV)

IT **13520-92-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of lanthanum oxide with zirconyl chloride hydrate and ammonium dihydrogen phosphate in aqueous nitric acid containing citric acid and ethylene glycol)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

CC 75-8 (Crystallography and Liquid Crystals)
Section cross-reference(s): 78
IT **156571-92-5P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation and crystal structure of)
IT 1312-81-8, Lanthanum oxide (La2O3) 7722-76-1, Ammonium dihydrogen phosphate **13520-92-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of lanthanum oxide with zirconyl chloride hydrate and ammonium dihydrogen phosphate in aqueous nitric acid containing citric acid and ethylene glycol)
REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 2 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1176403 HCAPLUS
DOCUMENT NUMBER: 143:441313
TITLE: Thermoplastic resin compositions with good light and heat resistance, mechanical strength, and surface smoothness for molded articles
INVENTOR(S): Kawa, Manabu; Soma, Minoru
PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 45 pp.

CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

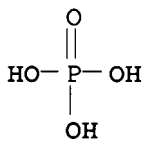
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005307190	A	20051104	JP 2005-83013	200503 23
PRIORITY APPLN. INFO.:			JP 2004-85945 A	200403 24

OTHER SOURCE(S): MARPAT 143:441313

AB Title compns. comprise (A) a thermoplastic resin and (B) phosphorus-containing nanoparticles as an UV-absorber or UV-absorbing particles containing the nanoparticles and dispersants. Thus, 100 mL aqueous solution containing 0.001 N cerium sulfate and 0.009 N titanium sulfate and 100 mL 0.01 N aqueous sodium pyrophosphate solution were mixed and copptd. to give a cerium titanium phosphorus oxide nanoparticle with number average primary particle diameter 20 nm, which was dispersed in ethanol solution containing 10 times (based on nano particle) 10-[2-(2-methoxyethoxy)ethoxy]ethoxydecylphosphoric acid obtained from triethylene glycol monomethyl ether, 1,10-dibromodecane, and tris(trimethylsilyl)phosphite and mech. pulverized to give a nanoparticle with number average primary particle diameter <50 nm, 1% of which was mixed with Novarex 7025A, kneaded, and injection-molded to give a test piece, showing good transparency and light resistance.

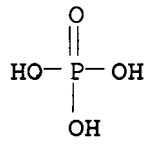
IT **13765-94-1P 13765-95-2P**, Zirconium α-phosphate
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(particle; thermoplastic resin compns. containing phosphorus-containing nanoparticles)

RN 13765-94-1 HCAPLUS
CN Phosphoric acid, titanium salt (8CI, 9CI) (CA INDEX NAME)



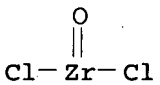
●x Ti(x)

RN 13765-95-2 HCAPLUS
CN Phosphoric acid, zirconium salt (8CI, 9CI) (CA INDEX NAME)



●x Zr(x)

IT **13520-92-8**, Zirconium oxychloride octahydrate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(raw material for particle preparation; thermoplastic resin compns. containing phosphorus-containing nanoparticles)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

IC ICM C08L101-00
ICS C01B025-45; C07F009-12; C08K003-32; C08K009-04
CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 38
IT **13765-94-1P 13765-95-2P**, Zirconium α-phosphate
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(particle; thermoplastic resin compns. containing phosphorus-containing nanoparticles)
IT 7550-45-0, Titanium tetrachloride, processes 7664-38-2, Phosphoric acid, processes **13520-92-8**, Zirconium oxychloride octahydrate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(raw material for particle preparation; thermoplastic resin compns. containing phosphorus-containing nanoparticles)

L59 ANSWER 3 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:718465 HCAPLUS
DOCUMENT NUMBER: 141:210133
TITLE: Method of preparation of tetravalent metal acid triphosphate compositions and membranes for fuel cells
INVENTOR(S): Alberti, Giulio; Vivani, Riccardo; Masci, Silvia
PATENT ASSIGNEE(S): Fuma-Tech Gesellschaft fuer Funktionelle Membranen und Anlagentechnologie m.b.H., Germany
SOURCE: PCT Int. Appl., 46 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent

LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004074179	A1	20040902	WO 2004-EP1514	200402 18
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2516174	A1	20040902	CA 2004-2516174	200402 18
EP 1594801	A1	20051116	EP 2004-712028	200402 18
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2006521265	T	20060921	JP 2006-501872	200402 18
US 2006194702	A1	20060831	US 2005-545091	200511 10

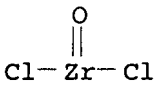
PRIORITY APPLN. INFO.:	IT 2003-PG5	A	200302 19
	WO 2004-EP1514	W	200402 18

AB This invention is based on the preparation of new solid acid triphosphates with compns. M(IV)(HPO4)(H2PO4)2, where M(IV) is a tetravalent metal or a mixture of tetravalent metals. These compds. are insol. in water the greater part of most organic solvents. They show a high nonwater assisted protonic conductivity (.apprx.0.01-0.04 S/cm at 100° and a relative humidity <1 %). These compds. can be used as proton conduction separators in electrochem. devices, to operate at low relative humidity values, as for example in different fuel cells, protonic pumps for electrochem. hydrogenation and dehydrogenation of organic compds., or for hydrogen production from hydrogenated organic compds. by electro-reforming, or also for removing hydrogen from equilibrium reactions. These compds. can also be used in electrochem. sensors, in supercapacitors and as acid catalysts in nonaq. or anhydrous gaseous phases.

IT **13520-92-8**, Zirconium oxychloride octahydrate
13933-56-7, Zirconium phosphate monohydrate (Zr(HPO4)2).h2o
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

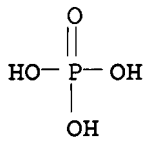
(method of preparation of tetravalent metal acid triphosphate compns. and membranes for fuel cells)

RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

RN 13933-56-7 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (2:1), monohydrate (8CI, 9CI) (CA INDEX NAME)

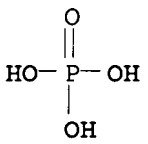


●1/2 H_2O

●1/2 Zr(IV)

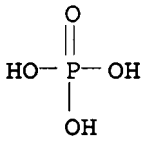
IT **31166-82-2P 107489-10-1P 742062-30-2P**
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(method of preparation of tetravalent metal acid triphosphate compns. and membranes for fuel cells)

RN 31166-82-2 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (3:1) (8CI, 9CI) (CA INDEX NAME)



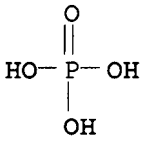
●1/3 Zr(IV)

RN 107489-10-1 HCAPLUS
CN Phosphoric acid, titanium(4+) salt (3:1) (9CI) (CA INDEX NAME)



●1/3 Ti(IV)

RN 742062-30-2 HCAPLUS
CN Phosphoric acid, hafnium(4+) salt (3:1) (9CI) (CA INDEX NAME)



●1/3 Hf(IV)

IC ICM C01B025-37
ICS B01J027-16; H01M008-00; B01D071-02; H01G009-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 49, 67, 76
IT 7440-32-6, Titanium, processes 7664-38-2, Phosphoric acid, processes **13520-92-8**, Zirconium oxychloride octahydrate **13933-56-7**, Zirconium phosphate monohydrate (Zr(HPO4)2).h2o 14456-34-9, Hafnium oxychloride octahydrate 25710-96-7
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(method of preparation of tetravalent metal acid triphosphate compns. and membranes for fuel cells)
IT **31166-82-2P 107489-10-1P 742062-30-2P**
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(method of preparation of tetravalent metal acid triphosphate compns. and membranes for fuel cells)
REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

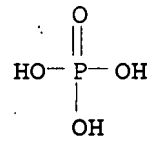
L59 ANSWER 4 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:635825 HCAPLUS
DOCUMENT NUMBER: 142:356171
TITLE: Preparation of PVA/PAM/zirconium phosphate membrane for proton exchange membranes
AUTHOR(S): Hwang, Ho Sang; Kim, Young Jin; Nam, Sang Yong; Rhim, Ji Won
CORPORATE SOURCE: Department of Chemical Engineering, Hannam University, Daejeon, 306-791, S. Korea
SOURCE: Memburein (2004), 14(2), 117-125
CODEN: MEMBEP; ISSN: 1226-0088
PUBLISHER: Membrane Society of Korea

DOCUMENT TYPE: Journal
LANGUAGE: Korean

AB Proton exchange membrane composed of PVA/PAM/ZrP was prepared and effect of PAM and ZrP contents on properties and performance of the membrane were investigated. PAM as a crosslinking agent was mixed into PVA solution with different concentration (7 .apprx. 11 wt%) and the PVA/PAM solution was cast to prepare PVA/PAM crosslinked membrane. The membrane was treated in the solution of zirconyl chloride and phosphoric acid to make a PVA/PAM/ZrP composite membrane. Methanol permeability, ion conductivity, swelling and ion exchange capacity of the membranes with different ZrP concentration were 10-8 .apprx. 10-6 cm2/s, 10-3 .apprx. 10-2 S/cm, 0.26 .apprx. 1.17 g H2O/g membrane and 2.59 .apprx. 5.1 meq/g membrane, resp. Methanol permeability and ion conductivity of the PVA/PAM/ZrP membrane were improved by 18% and 23%, resp., compared to those of the PVA/PAM membrane.

IT **13765-95-2P**, Zirconium phosphate
RL: MOA (Modifier or additive use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of PVA/PAM/zirconium phosphate membrane for proton exchange composite membranes)

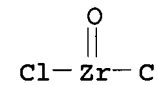
RN 13765-95-2 HCAPLUS
CN Phosphoric acid, zirconium salt (8CI, 9CI) (CA INDEX NAME)



●x Zr(x)

IT **13520-92-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of PVA/PAM/zirconium phosphate membrane for proton exchange composite membranes)

RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 52

IT **13765-95-2P**, Zirconium phosphate
RL: MOA (Modifier or additive use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of PVA/PAM/zirconium phosphate membrane for proton exchange composite membranes)

IT 7664-38-2, Phosphoric acid, reactions **13520-92-8**

RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of PVA/PAM/zirconium phosphate membrane for proton exchange composite membranes)

L59 ANSWER 5 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:287866 HCAPLUS
DOCUMENT NUMBER: 140:304227
TITLE: Olefin metallocene polymerization catalyst system containing a phosphinimine ligand and/or a ketimide ligand
INVENTOR(S): Gao, Xiaoliang; Kowalchuk, Matthew Gerald; Leighton, Jessie; Chisholm, P. Scott
PATENT ASSIGNEE(S): Nova Chemicals (International) S.A., Switz.
SOURCE: PCT Int. Appl., 26 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004029105	A1	20040408	WO 2003-CA1384	200309 10
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2405241	A1	20040324	CA 2002-2405241	200209 24
AU 2003266072	A1	20040419	AU 2003-266072	200309 10
US 2004097364	A1	20040520	US 2003-663129	200309 16
US 7001962	B2	20060221		
PRIORITY APPLN. INFO.:			CA 2002-2405241 A	200209 24
			WO 2003-CA1384 W	200309 10

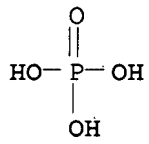
OTHER SOURCE(S): MARPAT 140:304227
AB A catalyst system comprises (1) a group 4 organometallic catalyst and (2) an activator comprising a solid zirconium acid component and a metal alkyl. The catalyst system is inexpensive and is highly

active for the polymerization of olefins. Preferred organometallic catalysts contain a cyclopentadienyl ligand, a phosphinimine ligand and/or a ketimide ligand.

IT **13772-29-7**
RL: CAT (Catalyst use); USES (Uses)
(olefin metallocene polymerization catalyst system containing a phosphinimine ligand and/or a ketimide ligand)

RN 13772-29-7 HCAPLUS

CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)

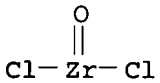


●1/2 Zr(IV)

IT **13520-92-8**
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(olefin metallocene polymerization catalyst system containing a phosphinimine ligand and/or a ketimide ligand)

RN 13520-92-8 HCAPLUS

CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

IC ICM C08F010-00

CC 35-3 (Chemistry of Synthetic High Polymers)

IT 97-93-8, Triethylaluminum, uses 100-99-2, Triisobutylaluminum, uses 1493-13-6, Trifluoromethanesulfonic acid 4229-34-9, Zirconium acetate 7664-38-2, Phosphoric acid, uses 7664-93-9, Sulfuric acid, uses 7699-43-6, Zirconyl chloride 10163-15-2, Phosphorofluoridic acid, disodium salt 13537-32-1, Fluorophosphoric acid **13772-29-7** 13826-66-9, Zirconyl nitrate 14311-93-4 14475-63-9, Zirconium hydroxide 14644-61-2, Zirconium sulfate 15667-84-2, Zirconium basic carbonate 20859-36-3, Monosodium fluorophosphate 73364-10-0, Dibutylzirconocene dichloride 107534-15-6, Bis(n-butylcyclopentadienyl)dimethylzirconium 219792-35-5 270256-35-4 532434-82-5
RL: CAT (Catalyst use); USES (Uses)
(olefin metallocene polymerization catalyst system containing a phosphinimine ligand and/or a ketimide ligand)

IT 12191-70-7, Sodium fluoride metaphosphate (Na2F(PO3))
13520-92-8

RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(olefin metallocene polymerization catalyst system containing a phosphinimine ligand and/or a ketimide ligand)
REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 6 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:3171 HCAPLUS
DOCUMENT NUMBER: 140:83714
TITLE: Ion exchange materials for use in a Bi-213 generator
INVENTOR(S): Sylvester, Paul
PATENT ASSIGNEE(S): Lynntech, Inc., USA
SOURCE: PCT Int. Appl., 25 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004001767	A1	20031231	WO 2003-US2810	200301 30
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2003228206	A1	20040106	AU 2003-228206	200301 30
US 2004069953	A1	20040415	US 2003-354929	200301 30
PRIORITY APPLN. INFO.:			US 2002-390677P P	200206 21
			WO 2003-US2810 W	200301 30

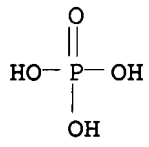
AB A bismuth-213 generator comprising an insol. composition having the general formula Zr(Phosphonate)x(HPO4)2-x nH2O, wherein x is between 0 and 2; and n is the number of waters of hydration; and wherein cations of radioactive isotopes selected from radium, actinium and combinations thereof are immobilized on the composition The value of x may be between about 0.2 and about 1. The phosphonate may be n-phosphonomethyl-miniodiacetic acid (PMIDA), wherein x may be

between about 0.1 and about 1.9. The phosphonate may be one or more phosphonate having the formula: H2O3P-(CH2)a-N-((CH2)bCO2H)-((CH2)cCO2H), wherein a, b, and c are nos. from 1 to 3 that may or may not be equal. The value of x may also be between about 0.1 and 1.9.

IT **13933-56-7DP**, Zirconium phosphate monohydrate Zr(HPO4)2·H2O, organic derivs.
RL: NUU (Other use, unclassified); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(ion exchange materials for use in Bi-213 generator)

RN 13933-56-7 HCAPLUS

CN Phosphoric acid, zirconium(4+) salt (2:1), monohydrate (8CI, 9CI) (CA INDEX NAME)



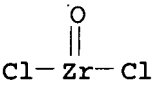
●1/2 H_2O

●1/2 Zr(IV)

IT **13520-92-8**, Zirconium chloride oxide octahydrate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(use for preparation of zirconium phosphonate phosphate as ion exchanging material for Bi-213 generator)

RN 13520-92-8 HCAPLUS

CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

IC ICM G21G004-08

CC 71-6 (Nuclear Technology)

IT 5994-61-6DP, n-Phosphonomethyl-iminodiacetic acid, derivs., zirconium salt 13817-79-3DP, derivs., zirconium salt **13933-56-7DP**, Zirconium phosphate monohydrate Zr(HPO4)2·H2O, organic derivs. 37451-80-2DP, derivs., zirconium salt
RL: NUU (Other use, unclassified); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(ion exchange materials for use in Bi-213 generator)

IT 5994-61-6, n-Phosphonomethyl-iminodiacetic acid 7664-38-2,

Phosphoric acid, processes **13520-92-8**, Zirconium chloride oxide octahydrate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(use for preparation of zirconium phosphonate phosphate as ion exchanging material for Bi-213 generator)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 7 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:396793 HCAPLUS
DOCUMENT NUMBER: 138:391011
TITLE: Granular zirconium phosphate
INVENTOR(S): Hai, Ton That; Sanders, Paul; Nordhaus, Mark; Karoor, Sujatha; Jiang, Cong; Melnick, Ben
PATENT ASSIGNEE(S): Baxter International Inc., USA
SOURCE: PCT Int. Appl., 28 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

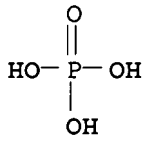
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003042098	A1	20030522	WO 2002-US29978	200209 20
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				
US 2003103888	A1	20030605	US 2001-993737	200111 13

PRIORITY APPLN. INFO.: US 2001-993737 A 200111 13

AB Compns. including zirconium phosphate particles as well as methods of synthesizing and using the compound for peritoneal dialysis are provided. The zirconium phosphate particles are synthesized through by using polyphosphate and zirconyl chloride. Thus, zirconium phosphate was obtained by the reaction of zirconyl chloride octahydrate with sodium tripolyphosphate in water. The particle size distribution of the zirconium phosphate obtained was determined. The compound can be used in peritoneal dialysis.

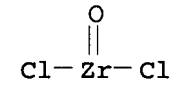
IT **13765-95-2**, Zirconium phosphate
RL: PRP (Properties); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(granular zirconium phosphate)

RN 13765-95-2 HCAPLUS
CN Phosphoric acid, zirconium salt (8CI, 9CI) (CA INDEX NAME)



●x Zr(x)

IT **13520-92-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(granular zirconium phosphate)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

IC ICM C01B025-37
ICS B01J020-02; B01J020-28; A61K033-42; C01G025-00
CC 63-7 (Pharmaceuticals)
Section cross-reference(s): 9, 49
IT **13765-95-2**, Zirconium phosphate
RL: PRP (Properties); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(granular zirconium phosphate)
IT 7699-43-6, Zirconyl chloride 7722-88-5, Sodium pyrophosphate 7758-29-4, Sodium tripolyphosphate 7785-84-4, Sodium trimetaphosphate **13520-92-8** 13826-66-9, Zirconyl nitrate 15578-19-5, Zirconyl sulfate
RL: RCT (Reactant); RACT (Reactant or reagent)
(granular zirconium phosphate)
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

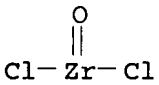
L59 ANSWER 8 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:254893 HCAPLUS
DOCUMENT NUMBER: 138:394769
TITLE: Direct Ion Exchange of Tris(2,2'-bipyridine)ruthenium(II) into an α-Zirconium Phosphate Framework
AUTHOR(S): Marti, Angel A.; Colon, Jorge L.
CORPORATE SOURCE: Department of Chemistry, University of Puerto Rico, Rio Piedras, 00931, P. R.
SOURCE: Inorganic Chemistry (2003), 42(9), 2830-2832
CODEN: INOCAJ; ISSN: 0020-1669
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The 1st direct ion exchange of a luminescent metal complex into an α-Zr phosphate framework was accomplished. A hydrated form of α-ZrP, with an expanded 10.3 Å interlayer distance, was used for the intercalation of Ru(bpy)32+, resulting in further expansion to 15.2 Å. The Ru(bpy)32+ luminescence band is slightly blue-shifted. High Ru(bpy)32+ loadings lead to luminescence self-quenching.

IT **13520-92-8**, Zirconium chloride oxide (ZrCl2O) octahydrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of α-zirconium phosphate hydrate)

RN 13520-92-8 HCAPLUS

CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)

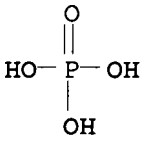


●8 H_2O

IT **54914-24-8P**, Zirconium phosphate (Zr(HPO4)2) hydrate
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and intercalation of tris(2,2'-bipyridine)ruthenium(II) in)

RN 54914-24-8 HCAPLUS

CN Phosphoric acid, zirconium(4+) salt (2:1), hydrate (9CI) (CA INDEX NAME)



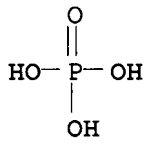
●x H_2O

●1/2 Zr(IV)

IT **54914-24-8DP**, Zirconium phosphate (Zr(HPO4)2) hydrate, intercalation product tris(2,2'-bipyridine)ruthenium(II)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(preparation and luminescence quenching of)

RN 54914-24-8 HCAPLUS

CN Phosphoric acid, zirconium(4+) salt (2:1), hydrate (9CI) (CA INDEX NAME)



●x H_2O

●1/2 Zr(IV)

CC 78-3 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 73
IT 7664-38-2, Phosphoric acid, reactions **13520-92-8**, Zirconium chloride oxide (ZrCl2O) octahydrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of α-zirconium phosphate hydrate)
IT **54914-24-8P**, Zirconium phosphate (Zr(HPO4)2) hydrate
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and intercalation of tris(2,2'-bipyridine)ruthenium(II) in)
IT 15158-62-0DP, Tris(2,2'-bipyridine)ruthenium(II), intercalation product with α-zirconium phosphate hydrate
54914-24-8DP, Zirconium phosphate (Zr(HPO4)2) hydrate, intercalation product tris(2,2'-bipyridine)ruthenium(II)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(preparation and luminescence quenching of)
REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

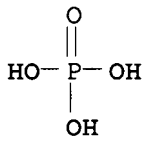
L59 ANSWER 9 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:768841 HCAPLUS
DOCUMENT NUMBER: 138:21323
TITLE: Zirconium Phosphate and Modified Zirconium Phosphates as Supports of Lipase. Preparation of the Composites and Activity of the Supported Enzyme
AUTHOR(S): Bellezza, Francesca; Cipiciani, Antonio; Costantino, Umberto; Negozio, M. Elena
CORPORATE SOURCE: Laboratorio di Chimica Organica and Laboratorio di Chimica Inorganica Dipartimento di Chimica, Universita di Perugia, Perugia, 06123, Italy
SOURCE: Langmuir (2002), 18(23), 8737-8742
CODEN: LANGD5; ISSN: 0743-7463
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Biocomposites with enzymic activity were obtained by adsorption of lipase from Candida rugosa on the surface of different layered zirconium phosphates and phosphonates such as α-zirconium hydrogen phosphate, solid dispersions of zirconium phosphate in

silica, zirconium carboxyethanephosphonate, zirconium phosphate-carboxyethanephosphonate, zirconium benzenephosphonate, and zirconium phosphate-benzenephosphonate. All the supports were characterized for chemical composition, BET sp. surface area, surface ion exchange capacity, and X-ray diffraction patterns. The adsorption process at 4 °C was studied as a function of time of equilibration of the support with the lipase solns. (0.5 mg/mL) and as a function of the amount of protein present in the equilibrating solution The activities of biocomposites with the different supports, at different protein loadings, were obtained by determining the amount of acetic acid produced by catalyzed hydrolysis of p-nitrophenylacetate. The best results in terms of protein surface adsorption (29 mg of protein/g of support) and of catalytic efficiency (95%) were achieved with hydrophobic supports based on zirconium benzenephosphonate. The biocomposites can be stored for more than one month at 4 °C without loss of enzymic activity, have been used in several cycles, and undergo limited thermal degradation when used at 40 °C.

IT **13765-95-2P**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(in silica; preparation of zirconium phosphate and modified zirconium phosphates as supports of lipase, preparation of the biocomposites and activity of the supported enzyme)

RN 13765-95-2 HCAPLUS

CN Phosphoric acid, zirconium salt (8CI, 9CI) (CA INDEX NAME)

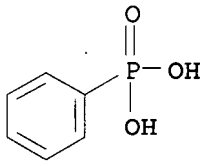


●x Zr(x)

IT **69031-88-5P**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(preparation of zirconium phosphate and modified zirconium phosphates as supports of lipase, preparation of the biocomposites and activity of the supported enzyme)

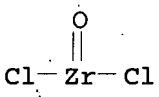
RN 69031-88-5 HCAPLUS

CN Phosphonic acid, phenyl-, zirconium(4+) salt (2:1) (9CI) (CA INDEX NAME)



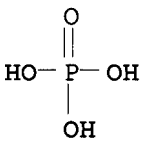
●1/2 Zr(IV)

IT **13520-92-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of zirconium phosphate and modified zirconium phosphates as supports of lipase, preparation of the biocomposites and activity of the supported enzyme)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

IT **13772-29-7P 75406-99-4P**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(support; preparation of zirconium phosphate and modified zirconium phosphates as supports of lipase, preparation of the biocomposites and activity of the supported enzyme)
RN 13772-29-7 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)



●1/2 Zr(IV)

RN 75406-99-4 HCAPLUS
CN Propanoic acid, 3-phosphono-, zirconium(4+) salt (2:1) (9CI) (CA INDEX NAME)

$HO_2C-CH_2-CH_2-PO_3H_2$

●1/2 Zr(IV)

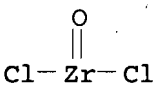
CC 7-7 (Enzymes)
IT **13765-95-2P**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(in silica; preparation of zirconium phosphate and modified zirconium phosphates as supports of lipase, preparation of the biocomposites and activity of the supported enzyme)
IT **69031-88-5P**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(preparation of zirconium phosphate and modified zirconium phosphates as supports of lipase, preparation of the biocomposites and activity of the supported enzyme)
IT 7664-38-2, Phosphoric acid, reactions **13520-92-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of zirconium phosphate and modified zirconium phosphates as supports of lipase, preparation of the biocomposites and activity of the supported enzyme)
IT 7631-86-9P, Silicon dioxide, properties **13772-29-7P** **75406-99-4P**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(support; preparation of zirconium phosphate and modified zirconium phosphates as supports of lipase, preparation of the biocomposites and activity of the supported enzyme)
REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 10 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:619486 HCAPLUS
DOCUMENT NUMBER: 137:303735
TITLE: Synthesis and characterization of ReP2O7 and of the Zr1-xRexP2O7 solid solutions
AUTHOR(S): Popa, Karin; Brandel, Vladimir; Cecal, Alexandru
CORPORATE SOURCE: Faculte de Chimie, Universite «Al. I. Cuza», Faculte de Chimie, Iasi, 6600, Rom.
SOURCE: Revue Roumaine de Chimie (2002), Volume Date 2001, 46(5), 509-515
CODEN: RRCHAX; ISSN: 0035-3930
PUBLISHER: Editura Academiei Romane
DOCUMENT TYPE: Journal
LANGUAGE: French
AB ReP2O7 and the Zr1-xRexP2O7 solid solns. were prepared via aqueous and solid-state methods and they were examined by XRD, IR, TG, electron microprobe anal., PIXE (particle induced x-ray emission anal.) and MEB (electron microscopy) methods. In the Zr1-xRexP2O7 solid solns. fluctuations of concentration were observed, probably due to the evaporation of Re at the surface. The results of XRD show that the volume of the unit

cells in the Zr1-xRexP2O7 solid solns. decrease linearly as the value of x increases. All attempts failed to synthesize Zr2-xRexO(PO4)2 solid solns. and pure pole Re2O(PO4)2.

IT **13520-92-8**, Zirconium oxychloride octahydrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of rhenium zirconium diphosphate solid solns. via solid-state method)

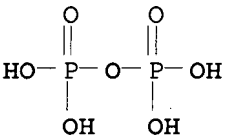
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

IT **468058-95-9P 468058-99-3P 468059-06-5P**
468059-12-3P 468059-18-9P 468059-22-5P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of rhenium diphosphate and rhenium zirconium diphosphate solid solns. by aqueous and solid-state methods)

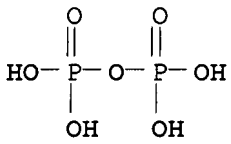
RN 468058-95-9 HCAPLUS
CN Diphosphoric acid, rhenium(4+) zirconium(4+) salt (2:1:1) (9CI) (CA INDEX NAME)



●1/2 Re(IV)

●1/2 Zr(IV)

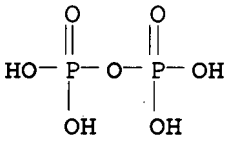
RN 468058-99-3 HCAPLUS
CN Diphosphoric acid, rhenium(4+) zirconium(4+) salt (10:7:3) (9CI) (CA INDEX NAME)



●7/10 Re(IV)

●3/10 Zr(IV)

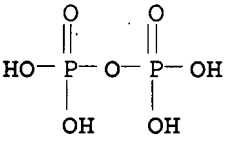
RN 468059-06-5 HCAPLUS
CN Diphosphoric acid, rhenium(4+) zirconium(4+) salt (10:9:1) (9CI) (CA INDEX NAME)



●9/10 Re(IV)

●1/10 Zr(IV)

RN 468059-12-3 HCAPLUS
CN Diphosphoric acid, rhenium(4+) zirconium(4+) salt (10:1:9) (9CI) (CA INDEX NAME)

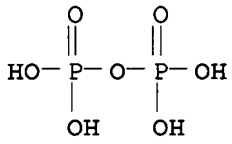


●1/10 Re(IV)

●9/10 Zr(IV)

RN 468059-18-9 HCAPLUS

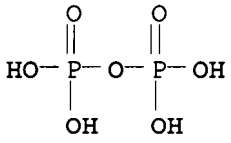
CN Diphosphoric acid, rhenium(4+) zirconium(4+) salt (10:3:7) (9CI) (CA INDEX NAME)



●3/10 Re(IV)

●7/10 Zr(IV)

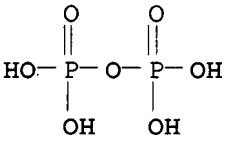
RN 468059-22-5 HCAPLUS
CN Diphosphoric acid, rhenium(4+) zirconium(4+) salt (5:1:4) (9CI) (CA INDEX NAME)



●1/5 Re(IV)

●4/5 Zr(IV)

IT **13565-97-4P**, Zirconium diphosphate (ZrP2O7)
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of zirconium diphosphate via aqueous method)
RN 13565-97-4 HCAPLUS
CN Diphosphoric acid, zirconium(4+) salt (1:1) (9CI) (CA INDEX NAME)



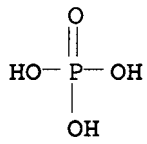
● Zr(IV)

CC 78-2 (Inorganic Chemicals and Reactions)

Section cross-reference(s): 75
IT **13520-92-8**, Zirconium oxychloride octahydrate 468059-25-8, Zirconium tetranitrate tetrahydrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of rhenium zirconium diphosphate solid solns. via solid-state method)
IT **468058-95-9P 468058-99-3P 468059-06-5P 468059-12-3P 468059-18-9P 468059-22-5P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of rhenium diphosphate and rhenium zirconium diphosphate solid solns. by aqueous and solid-state methods)
IT **13565-97-4P**, Zirconium diphosphate (ZrP2O7)
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of zirconium diphosphate via aqueous method)
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

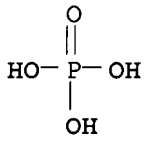
L59 ANSWER 11 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:446525 HCAPLUS
DOCUMENT NUMBER: 138:58257
TITLE: Possibilities and perspectives of the mechanochemical synthesis of highly disperse skeletal zirconium phosphates
AUTHOR(S): Sadykov, V. A.; Pavlova, S. N.; Chaikina, M. V.; Zabolotnaya, G. V.; Maksimovskaya, R. I.; Tsybulya, S. V.; Burgina, E. B.; Zaikovskii, V. I.; Litvak, G. S.; Frolova, Yu. V.; Kochubei, D. I.; Kriventsov, V. V.; Paukshtis, E. A.; Kolomiichuk, V. N.; Ivanov, V. P.; Anufrienko, V. F.; Boldyreva, N. N.; Kuznetsova, N. N.; Lunin, V. V.; Agrawal, D.; Roy, R.
CORPORATE SOURCE: Inst. Kataliza im. G. K. Boreskova, Sib. Otd. RAN, Novosibirsk, 630090, Russia
SOURCE: Khimiya v Interesakh Ustoichivogo Razvitiya (2002), 10(1-2), 227-235
CODEN: KIURFI; ISSN: 0869-8538
PUBLISHER: Siberian Branch of the Russian Academy of Sciences
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The results of systematic studies of highly disperse skeletal zirconium phosphates synthesis are discussed. The synthesis was carried out by mechanochem. activation of solid salts mixts. with following hydrothermal treatment in the presence of surfactants, drying, and calcination. The genesis and phase compns. of these complex systems were studied using numerous methods. The local crystal structure of zirconium phosphates nuclei originating in the mechanochem. activated products and the space distribution of added cations inside these nanoparticles depend strongly on the composition of precursors that determine the interaction in the activated mixture In its turn, that results in two different crystallization mechanisms of the highly disperse skeletal zirconium phosphates during hydrothermal treatment; (1) solution - sedimentation, or (2) directed link-up of the primary particles. The factors that determine the structure type, thermal stability, surface composition, and solubility of crystal skeletal zirconium phosphates prepared by mechanochem. activation are studied and summarized depending on the composition of the systems.
IT **13765-95-2P**, Zirconium phosphate **67972-91-2P**, Cobalt zirconium phosphate (CoZr4(PO4)6)

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(mechanochem. synthesis of highly-disperse skeletal zirconium phosphates)
RN 13765-95-2 HCAPLUS
CN Phosphoric acid, zirconium salt (8CI, 9CI) (CA INDEX NAME)



●x Zr(x)

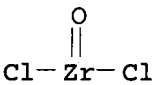
RN 67972-91-2 HCAPLUS
CN Phosphoric acid, cobalt(2+) zirconium(4+) salt (6:1:4) (9CI) (CA INDEX NAME)



●1/6 Co(II)

●2/3 Zr(IV)

IT **13520-92-8**, Zirconium chloride oxide (ZrCl2O) octahydrate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(precursor, mixture component; mechanochem. synthesis of highly-disperse skeletal zirconium phosphates)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

CC 49-5 (Industrial Inorganic Chemicals)
IT **13765-95-2P**, Zirconium phosphate **67972-91-2P**,

Cobalt zirconium phosphate (CoZr4(PO4)6)
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(mechanochem. synthesis of highly-disperse skeletal zirconium phosphates)

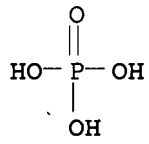
IT 7722-76-1, Ammonium phosphate (NH4H2PO4) 7783-28-0
13520-92-8, Zirconium chloride oxide (ZrCl2O) octahydrate
52788-97-3
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(precursor, mixture component; mechanochem. synthesis of highly-disperse skeletal zirconium phosphates)

L59 ANSWER 12 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:808358 HCAPLUS
DOCUMENT NUMBER: 136:193154
TITLE: Hydrothermal synthesis and thermal stability of layered compounds of tetravalent metal phosphates
AUTHOR(S): Zhang, Rui; Hu, Yuan; Song, Lei; Zhu, Yu-rui; Fan, Wei-cheng; Chen, Zu-yao
CORPORATE SOURCE: State Key Lab. of Fire Science, Univ. Science and Technology of China, Hefei, 230026, Peop. Rep. China
SOURCE: Zhongguo Youse Jinshu Xuebao (2001), 11(5), 895-899
CODEN: ZYJXFK; ISSN: 1004-0609
PUBLISHER: Zhongguo Youse Jinshu Xuebao Bianjibu
DOCUMENT TYPE: Journal
LANGUAGE: Chinese

AB A series of well crystalline samples of acid salts with ideal general formula of α-M(HPO4)2·H2O (α-Zirconium phosphate(α-ZrP), α-Tin phosphate(α-SnP) and α-Titanium phosphate(α-TiP)) were prepared by hydrothermal method and characterized by XRD, IR, TEM and TG/DSC. The results suggest that the optimum experiment conditions (time, temperature, phosphoric acid concentration) of forming these layered phosphate are 48 h, 180°C, 8 mol/L for α-ZrP; 6 h, 180°C, 9 mol/L for α-SnP and 6 h, 180°C, 10 mol/L for α-TiP, and hydrothermal synthesis is an optimum route for preparing layered compound of tetravalent metal phosphate. The crystalline samples possess a highly thermal stability and regular morphol.

IT **13933-56-7P**, Zirconium phosphate (Zr(HPO4)2) monohydrate
15844-56-1P, Titanium phosphate (Ti(HPO4)2) monohydrate
19513-14-5P, Tin phosphate (Sn(HPO4)2) monohydrate
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(hydrothermal synthesis and thermal stability of layered compds. of tetravalent metal phosphates)

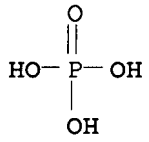
RN 13933-56-7 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (2:1), monohydrate (8CI, 9CI) (CA INDEX NAME)



●1/2 H_2O

●1/2 Zr(IV)

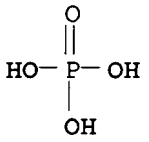
RN 15844-56-1 HCAPLUS
CN Phosphoric acid, titanium(4+) salt (2:1), monohydrate (8CI, 9CI) (CA INDEX NAME)



●1/2 H_2O

●1/2 Ti(IV)

RN 19513-14-5 HCAPLUS
CN Phosphoric acid, tin(4+) salt (2:1), monohydrate (8CI, 9CI) (CA INDEX NAME)

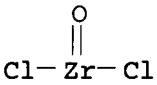


●1/2 H_2O

●1/2 Sn(IV)

IT **13520-92-8**, Zirconium chloride oxide (ZrCl2O) octahydrate

RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrothermal synthesis and thermal stability of layered compds. of tetravalent metal phosphates)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



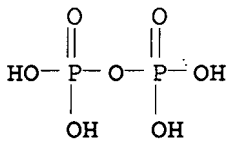
●8 H_2O

CC 78-5 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 69, 73, 75
IT **13933-56-7P**, Zirconium phosphate (Zr(HPO4)2) monohydrate
15844-56-1P, Titanium phosphate (Ti(HPO4)2) monohydrate
19513-14-5P, Tin phosphate (Sn(HPO4)2) monohydrate
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(hydrothermal synthesis and thermal stability of layered compds. of tetravalent metal phosphates)
IT 5593-70-4 7646-78-8, Tin chloride (SnCl4), reactions 7664-38-2, Phosphoric acid, reactions **13520-92-8**, Zirconium chloride oxide (ZrCl2O) octahydrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrothermal synthesis and thermal stability of layered compds. of tetravalent metal phosphates)

L59 ANSWER 13 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:464068 HCAPLUS
DOCUMENT NUMBER: 135:220060
TITLE: The influence of solid precursors nature on structural, textural and surface properties of framework zirconium phosphates synthesized via mechanochemical activation
AUTHOR(S): Pavlova, S. N.; Sadykov, V. A.; Zabolotnaya, G. V.; Maximovskaya, R. I.; Zaikovskii, V. I.; Tsybulya, S. V.; Burgina, E. B.; Chaikina, M. V.; Agrawal, D.; Roy, R.
CORPORATE SOURCE: Boreskov Institute of Catalysis SB RAS, Novosibirsk, 630090, Russia
SOURCE: Solid State Ionics (2001), 141-142, 683-688
CODEN: SSIOD3; ISSN: 0167-2738
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The framework zirconium phosphates with incorporated La3+ and NH4+ cations were synthesized via mech. activation of solids followed by the hydrothermal treatment. Their phase composition, local bulk structure, surface properties and microstructure appear to be defined both by the structure of amorphous zirconium phosphates formed via mech. activation of solids depending on precursors acidity and reactivity and by the pH-dependent mechanism of subsequent crystallization during hydrothermal treatment.
IT **13565-97-4P**, Zirconium pyrophosphate **89091-95-2P**, Ammonium zirconium phosphate ((NH4)Zr2(PO4)3)

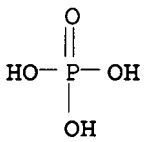
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(effect of precursors on structural, textural and surface properties of framework ammonium zirconium phosphates prepared via mechanochem. activation)

RN 13565-97-4 HCAPLUS
CN Diphosphoric acid, zirconium(4+) salt (1:1) (9CI) (CA INDEX NAME)



● Zr(IV)

RN 89091-95-2 HCAPLUS
CN Phosphoric acid, ammonium zirconium(4+) salt (3:1:2) (9CI) (CA INDEX NAME)

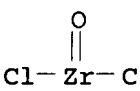


● 1/3 NH_3

● 2/3 Zr(IV)

IT **13520-92-8**, Zirconium oxychloride octahydrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(effect of precursors on structural, textural and surface properties of framework ammonium zirconium phosphates prepared via mechanochem. activation)

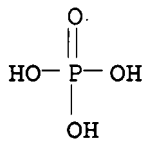
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



● 8 H_2O

IT **13765-95-2P**, Zirconium phosphate

RL: SPN (Synthetic preparation); PREP (Preparation)
(effect of precursors on structural, textural and surface properties of framework ammonium zirconium phosphates prepared via mechanochem. activation)
RN 13765-95-2 HCAPLUS
CN Phosphoric acid, zirconium salt (8CI, 9CI) (CA INDEX NAME)



●x Zr(x)

CC 78-5 (Inorganic Chemicals and Reactions)
IT **13565-97-4P**, Zirconium pyrophosphate 13778-59-1P, Lanthanum phosphate (LaPO4) 87048-05-3P, Zirconium hydroxide phosphate (Zr(OH)(PO4)) **89091-95-2P**, Ammonium zirconium phosphate ((NH4)Zr2(PO4)3)
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(effect of precursors on structural, textural and surface properties of framework ammonium zirconium phosphates prepared via mechanochem. activation)
IT 7722-76-1, Ammonium dihydrogen phosphate 7783-28-0, Diammonium hydrogen phosphate 10277-43-7, Lanthanum nitrate hexahydrate **13520-92-8**, Zirconium oxychloride octahydrate 13826-66-9, Zirconium oxynitrate 25322-68-3, Polyethylene oxide 25447-33-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(effect of precursors on structural, textural and surface properties of framework ammonium zirconium phosphates prepared via mechanochem. activation)
IT **13765-95-2P**, Zirconium phosphate
RL: SPN (Synthetic preparation); PREP (Preparation)
(effect of precursors on structural, textural and surface properties of framework ammonium zirconium phosphates prepared via mechanochem. activation)
REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 14 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:663045 HCAPLUS
DOCUMENT NUMBER: 134:30897
TITLE: Porous zirconium phosphates prepared by surfactant-assisted precipitation
AUTHOR(S): Sun, Y.; Afanasiev, P.; Vrinat, M.; Coudurier, G.
CORPORATE SOURCE: Institut de Recherches sur la Catalyse, CNRS, Villeurbanne, 69626, Fr.
SOURCE: Journal of Materials Chemistry (2000), 10(10), 2320-2324
CODEN: JMACEP; ISSN: 0959-9428
PUBLISHER: Royal Society of Chemistry
DOCUMENT TYPE: Journal

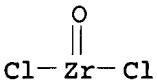
LANGUAGE: English

AB Porous zirconium phosphates with surface areas in the range 400-500 m2/g have been prepared by aqueous precipitation in the presence of various surfactants, followed by thermal treatment at 773 K. Preparation conditions, including surfactant nature and concentration, type of precipitating agent and fluoride additives were found to have significant influence on the textural properties of the resulting solids. X-ray diffraction showed that, before calcination, refluxed samples have an ordered lamellar structure which disappears upon oxidation of the surfactant. IR and 31P MAS NMR spectroscopy indicate formation of P-O-P bonds due to condensation of phosphate groups during the heat treatment.

IT **13520-92-8**
RL: NUU (Other use, unclassified); USES (Uses)
(precursor; in preparation of porous zirconium phosphates by surfactant-assisted precipitation)

RN 13520-92-8 HCAPLUS

CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)

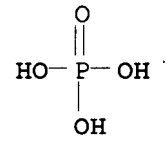


●8 H_2O

IT **13765-95-2**, Zirconium phosphate
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(preparation of porous zirconium phosphates by surfactant-assisted precipitation)

RN 13765-95-2 HCAPLUS

CN Phosphoric acid, zirconium salt (8CI, 9CI) (CA INDEX NAME)



●x Zr(x)

CC 49-5 (Industrial Inorganic Chemicals)

IT **13520-92-8**
RL: NUU (Other use, unclassified); USES (Uses)
(precursor; in preparation of porous zirconium phosphates by surfactant-assisted precipitation)

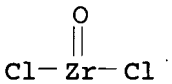
IT **13765-95-2**, Zirconium phosphate
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(preparation of porous zirconium phosphates by surfactant-assisted precipitation)

REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 15 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:803353 HCAPLUS
DOCUMENT NUMBER: 132:115638
TITLE: Trivalent Sc3+ ion conduction in Sc1/3Zr2(PO4)3 solids with the NASICON-type structure
AUTHOR(S): Tamura, Shinji; Imanaka, Nobuhito; Adachi, Ginya
CORPORATE SOURCE: Dep. Applied Chemistry, Faculty Engineering, Osaka Univ., Suita, 565, Japan
SOURCE: Advanced Materials (Weinheim, Germany) (1999), 11(18), 1521-1523
CODEN: ADVMEW; ISSN: 0935-9648
PUBLISHER: Wiley-VCH Verlag GmbH
DOCUMENT TYPE: Journal
LANGUAGE: English

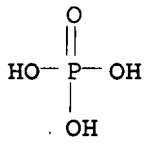
AB The new solid electrolyte, Sc1/3Zr2(PO4)3, was prepared by a sol-gel method and the conducting properties of its trivalent Sc3+ were studied. This phosphate-based electrolyte can be applied to a variety of atms. including a reducing one.

IT **13520-92-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of Sc1/3Zr2(PO4)3 solid electrolyte with NASICON-type structure)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

IT **255885-67-7P**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(preparation of Sc1/3Zr2(PO4)3 solid electrolyte with NASICON-type structure and its trivalent Sc3+ ion conduction)
RN 255885-67-7 HCAPLUS
CN Phosphoric acid, scandium(3+) zirconium(4+) salt (9:1:6) (9CI) (CA INDEX NAME)



●1/9 Sc(III)

●2/3 Zr(IV)

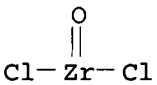
CC 76-1 (Electric Phenomena)
Section cross-reference(s): 78
IT 7722-76-1, Ammonium dihydrogenphosphate 12060-08-1, Scandia **13520-92-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of Sc1/3Zr2(PO4)3 solid electrolyte with NASICON-type structure)
IT **255885-67-7P**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)
(preparation of Sc1/3Zr2(PO4)3 solid electrolyte with NASICON-type structure and its trivalent Sc3+ ion conduction)
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 16 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:450437 HCAPLUS
DOCUMENT NUMBER: 131:193216
TITLE: Preparation of Mixed Phosphates in Molten Alkali Metal Nitrates
AUTHOR(S): Afanasiev, P.
CORPORATE SOURCE: Institut de Recherche sur la Catalyse, Villeurbanne, 69626, Fr.
SOURCE: Chemistry of Materials (1999), 11(8), 1999-2007
CODEN: CMATEX; ISSN: 0897-4756
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Mixed phosphates of alkali metals and main group or transition metals were obtained from the reactions of different starting salts of metals (nitrates, chlorides) and ammonium H monophosphate at 673-823 K in the alkali metal nitrate fluxes. The products obtained include submicrometer dispersions of known com. important compds., among which are KTiOPO4 (KTP), a number of ABPO4 phases (A stands for alkali metal; B, bivalent transition or main group metal), as well as various substituted phases, derived from the NASICON NaZr2(PO4)3 and lamellar Zr phosphate structure. Sometimes novel mixed phosphates were formed, such as those of Na and Ni or Co, for which stoichiometric composition and/or elementary cell parameters were established. The dependence of composition of solid products on the

nature of reacting species and reaction conditions is discussed. Possible extensions of method by chemical modifications with admixts. of nitrite and fluoride species were considered and illustrated by several examples.

IT **13520-92-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactant for preparation of transition metal alkali metal phosphates)

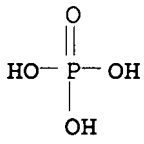
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

IT **19527-81-2P 19527-82-3P 22239-24-3P**
28132-50-5P 34370-44-0P 42711-69-3P
108809-54-7P 124040-90-0P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(surface area and preparation from phosphate and alkali metal nitrate molten fluxes)

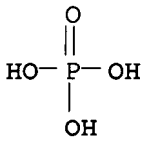
RN 19527-81-2 HCAPLUS
CN Phosphoric acid, sodium zirconium(4+) salt (3:1:2) (8CI, 9CI) (CA INDEX NAME)



●1/3 Na

●2/3 Zr(IV)

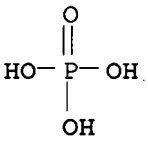
RN 19527-82-3 HCAPLUS
CN Phosphoric acid, potassium zirconium(4+) salt (3:1:2) (8CI, 9CI) (CA INDEX NAME)



●1/3 K

●2/3 Zr(IV)

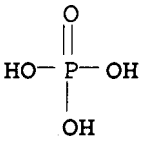
RN 22239-24-3 HCAPLUS
CN Phosphoric acid, sodium titanium(4+) salt (3:1:2) (8CI, 9CI) (CA INDEX NAME)



●1/3 Na

●2/3 Ti(IV)

RN 28132-50-5 HCAPLUS
CN Phosphoric acid, sodium zirconium(4+) salt (2:2:1) (8CI, 9CI) (CA INDEX NAME)

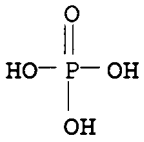


● Na

●1/2 Zr(IV)

RN 34370-44-0 HCAPLUS

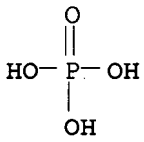
CN Phosphoric acid, potassium zirconium(4+) salt (2:2:1) (8CI, 9CI) (CA INDEX NAME)



● K

●1/2 Zr(IV)

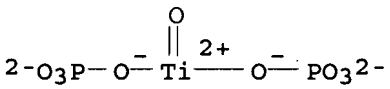
RN 42711-69-3 HCAPLUS
CN Phosphoric acid, lead(2+) sodium salt (1:1:1) (9CI) (CA INDEX NAME)



● Na

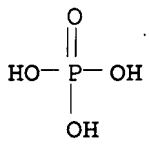
● Pb(II)

RN 108809-54-7 HCAPLUS
CN Titanate(4-), oxobis[phosphato(3-)-κO]-, tetrapotassium (9CI) (CA INDEX NAME)



●4 K^+

RN 124040-90-0 HCAPLUS
CN Phosphoric acid, hafnium(4+) sodium salt (2:1:2) (9CI) (CA INDEX NAME)



●1/2 Hf(IV)

● Na

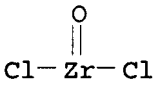
CC 78-6 (Inorganic Chemicals and Reactions)
IT 3251-23-8, Copper dinitrate 7631-99-4, Nitric acid sodium salt, reactions 7646-85-7, Zinc chloride, reactions 7722-76-1, Monoammonium phosphate 7757-79-1, Nitric acid potassium salt, reactions 7782-61-8, Iron trinitrate nonahydrate 7791-18-6, Magnesium chloride hexahydrate 10022-31-8, Barium nitrate 10026-22-9, Cobalt dinitrate hexahydrate 10099-74-8, Lead nitrate 10361-44-1, Bismuth nitrate 13478-00-7, Nickel dinitrate hexahydrate 13499-05-3, Hafnium tetrachloride **13520-92-8** 13825-74-6 17272-45-6, Lanthanum trichloride hexahydrate 185387-06-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactant for preparation of transition metal alkali metal phosphates)
IT 13778-59-1P 13780-17-1P 13826-55-6P **19527-81-2P** **19527-82-3P** 20539-12-2P 20670-20-6P **22239-24-3P** **28132-50-5P** 31092-86-1P **34370-44-0P** **42711-69-3P** 53201-91-5P 53604-59-4P 66604-37-3P 108334-89-0P **108809-54-7P** **124040-90-0P** 239809-02-0P 239809-03-1P, Sodium zirconium phosphate (Na3.88Zr1.28(PO4)3) 239809-04-2P, Nickel sodium (diphosphate) phosphate (Ni2Na3(P2O7)(PO4)) 239809-05-3P, Nickel potassium (diphosphate) phosphate (Ni4K2(P2O7)2(PO4))
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(surface area and preparation from phosphate and alkali metal nitrate molten fluxes)
REFERENCE COUNT: 53 THERE ARE 53 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 17 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:327952 HCAPLUS
DOCUMENT NUMBER: 131:60681
TITLE: Synthesis of high-surface-area complex zirconium phosphates via mechanochemical activation route
AUTHOR(S): Sadykov, Vladislav A.; Pavlova, Svetlana N.; Zabolotnaya, Galina V.; Maximovskaya, Raisa I.; Tsybulya, Sergei V.; Burgina, Elena B.; Zaikovskii, Vladimir I.; Litvak, Galina S.; Chaikina, Marina V.; Lunin, Valerii V.; Kuznetsova, Natalya N.; Roy, Rustum; Agrawal, Dinesh K.
CORPORATE SOURCE: The Boreskov Institute of Catalysis SB RAS, Novosibirsk State University, Novosibirsk,

630090, Russia
SOURCE: Materials Research Innovations (1999), 2(6), 328-337
CODEN: MRINFV; ISSN: 1432-8917
PUBLISHER: Springer-Verlag
DOCUMENT TYPE: Journal
LANGUAGE: English

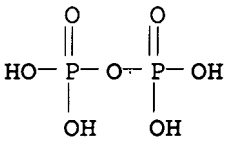
AB High-power ball mill activation of the mixture of hydrated zirconium and lanthanum salts (oxonitrates, oxochlorides) with ammonium phosphate followed by hydrothermal treatment at temps. not exceeding 200° and a nearly neutral pH was found to yield crystalline dispersed phase of a cubic NH4Zr2(PO4)3 type along with admixts. of disordered orthorhombic compds. of a zirconium orthophosphate type. In the same conditions and at the same Zr/P ratio, hydrothermal treatment of gels obtained by reacting mixed zirconium and lanthanum nitrates solns. with ammonium phosphates yields no crystalline products, and only treatment in acid media generates a phase of the α-ZrPO4(OH) type coexisting with the NH4Zr2(PO4)3 phase if polyethylene oxide is present. X-ray powder diffraction, transmission electron microscopy, 31MAS-NMR, FTIRS and thermal anal. were applied to elucidate factors affecting crystallization of complex zirconium phosphates in the hydrothermal conditions. The most essential factor appears to be generation of some nuclei of zirconium phosphates under high pressures developed in the course of mixed solids mech. activation. These nuclei are embedded into matrix of such well-crystallized solid products as ammonium nitrate or chloride. Hence, metastable cubic or orthorhombic structure of the phases obtained via mech. activation route can be assigned to the nuclei-matrix orientation relationship. Due to easily scaled-up synthesis procedure, these results appear to be very promising for manufacturing of dispersed framework zirconium phosphates as acid catalysts or fast proton conductors.

IT **13520-92-8**, Zirconium oxychloride octahydrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(synthesis of high-surface-area complex zirconium phosphates via mechanochem. activation route)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



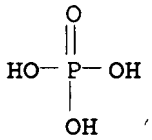
●8 H_2O

IT **13565-97-4P**, Zirconium pyrophosphate **89091-95-2P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(synthesis of high-surface-area complex zirconium phosphates via mechanochem. activation route)
RN 13565-97-4 HCAPLUS
CN Diphosphoric acid, zirconium(4+) salt (1:1) (9CI) (CA INDEX NAME)



● Zr(IV)

RN 89091-95-2 HCAPLUS
CN Phosphoric acid, ammonium zirconium(4+) salt (3:1:2) (9CI) (CA INDEX NAME)



●1/3 NH_3

●2/3 Zr(IV)

CC 49-5 (Industrial Inorganic Chemicals)
Section cross-reference(s): 67
IT 587-26-8, Lanthanum carbonate 7783-28-0, Diammonium phosphate 10099-59-9, Lanthanum trinitrate 10361-65-6, Triammonium phosphate **13520-92-8**, Zirconium oxychloride octahydrate 13826-66-9, Zirconium oxide dinitrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(synthesis of high-surface-area complex zirconium phosphates via mechanochem. activation route)
IT **13565-97-4P**, Zirconium pyrophosphate 87048-05-3P, Zirconium hydroxide phosphate Zr(OH)PO4 **89091-95-2P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(synthesis of high-surface-area complex zirconium phosphates via mechanochem. activation route)
REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 18 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1997:654641 HCAPLUS
DOCUMENT NUMBER: 128:8403
TITLE: X-Ray Photoelectron Spectroscopic Study of Alternately Layered Zirconium and Hafnium Phosphonate Thin Films on Silicon Substrates
AUTHOR(S): Umemura, Yasushi; Yamagishi, Akihiko; Tanaka, Ken-ichi
CORPORATE SOURCE: National Defense Academy, Yokosuka, Kanagawa,

239, Japan
SOURCE: Bulletin of the Chemical Society of Japan (1997), 70(10), 2399-2403
CODEN: BCSJA8; ISSN: 0009-2673
PUBLISHER: Chemical Society of Japan
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Multilayer films of alternately layered Zr and Hf phosphonates on Si substrates were prepared and characterized by XPS. The multilayer film is built up layer-by-layer in the repeated order of a Zr phosphonate layer and a Hf phosphonate layer. The relative peak intensity of the Zr 3d line to the Hf 4d5/2 line in the photoelectron spectra of the film takes a lower value as the take-off angle between the surface normal and the detector (α) increases. The mean free path of a photoelectron with an energy of .apprx.1000 eV is 70--90 A in the film by analyzing the α dependence of the relative peak intensities.

IT **123012-91-9P 123012-93-1P**
RL: OCU (Occurrence, unclassified); PNU (Preparation, unclassified); PRP (Properties); OCCU (Occurrence); PREP (Preparation)
(x-ray photoelectron spectroscopic study of alternately layered zirconium and hafnium phosphonate thin films on silicon substrates)

RN 123012-91-9 HCAPLUS
CN Phosphonic acid, 1,10-decanediylbis-, hafnium(4+) salt (9CI) (CA INDEX NAME)

$H_2O_3P-(CH_2)_{10}-PO_3H_2$

●x Hf(IV)

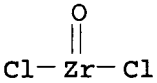
RN 123012-93-1 HCAPLUS
CN Phosphonic acid, 1,10-decanediylbis-, zirconium(4+) salt (9CI) (CA INDEX NAME)

$H_2O_3P-(CH_2)_{10}-PO_3H_2$

●x Zr(IV)

IT **13520-92-8**, Zirconium dichloride oxide octahydrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(x-ray photoelectron spectroscopic study of alternately layered zirconium and hafnium phosphonate thin films on silicon substrates prepared using)

RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)

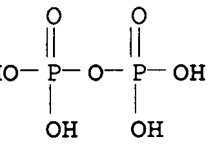


●8 H_2O

CC 73-6 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
IT **123012-91-9P 123012-93-1P**
RL: OCU (Occurrence, unclassified); PNU (Preparation, unclassified); PRP (Properties); OCCU (Occurrence); PREP (Preparation)
(x-ray photoelectron spectroscopic study of alternately layered zirconium and hafnium phosphonate thin films on silicon substrates)
IT 5943-21-5, 1,10-Decanediylbis(phosphonic acid) **13520-92-8**, Zirconium dichloride oxide octahydrate 14456-34-9 18132-72-4 123012-94-2, 3-(Hydroxydimethylsilyl)propylphosphonic acid
RL: RCT (Reactant); RACT (Reactant or reagent)
(x-ray photoelectron spectroscopic study of alternately layered zirconium and hafnium phosphonate thin films on silicon substrates prepared using)
REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

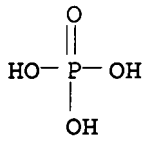
L59 ANSWER 19 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1997:525267 HCAPLUS
DOCUMENT NUMBER: 127:184788
TITLE: Physicochemical transformations during synthesis of double K-Zr phosphates in a melt of potassium nitrate
AUTHOR(S): Barabanova, A. V.; Afanas'ev, P. V.; Turakulova, O. A.; Kostyuk, B. G.; Lunin, V. V.
CORPORATE SOURCE: Department of Chemistry, M. V. Lomonosov Moscow State University, Moscow, 119899, Russia
SOURCE: Russian Chemical Bulletin (Translation of Izvestiya Akademii Nauk, Seriya Khimicheskaya) (1997), 46(4), 637-640
CODEN: RCBUEY; ISSN: 1066-5285
PUBLISHER: Consultants Bureau
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Double phosphates of K and Zr with three-dimensional and layered structure were synthesized in a melt of KNO3 at 300-550°. The double phosphates were formed with participation of three components of a reaction mixture: ZrOCl2·8H2O-(NH4)2HPO4-KNO3, in which KNO3 was both an active component of the reaction mixture and the reaction medium. The influence of the nature of the starting reagents on the composition of the reaction products and on the sequence and stoichiometry of the reactions proceeding in the reaction mixture were studied by TG and mass-spectrometry.
IT **13565-97-4P**, Zirconium diphosphate (ZrP2O7)
RL: BYP (Byproduct); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
(physicochem. transformations during synthesis of double K-Zr phosphates in a melt of potassium nitrate)

RN 13565-97-4 HCAPLUS
CN Diphosphoric acid, zirconium(4+) salt (1:1) (9CI) (CA INDEX NAME)



● Zr(IV)

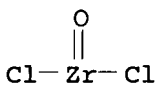
IT **54408-13-8**, Potassium zirconium phosphate (KZrH(PO4)2)
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); RCT (Reactant); FORM (Formation, nonpreparative); PROC (Process); RACT (Reactant or reagent)
(physicochem. transformations during synthesis of double K-Zr phosphates in a melt of potassium nitrate)
RN 54408-13-8 HCAPLUS
CN Phosphoric acid, potassium zirconium(4+) salt (2:1:1) (9CI) (CA INDEX NAME)



●1/2 K

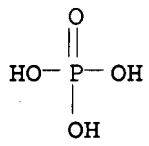
●1/2 Zr(IV)

IT **13520-92-8 19527-82-3**, Potassium zirconium phosphate (KZr2(PO4)3)
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(physicochem. transformations during synthesis of double K-Zr phosphates in a melt of potassium nitrate)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

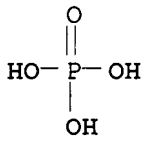
RN 19527-82-3 HCAPLUS
CN Phosphoric acid, potassium zirconium(4+) salt (3:1:2) (8CI, 9CI) (CA INDEX NAME)



●1/3 K

●2/3 Zr(IV)

IT **34370-44-0P**, Potassium zirconium phosphate (K2Zr(PO4)2)
RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(physicochem. transformations during synthesis of double K-Zr phosphates in a melt of potassium nitrate)
RN 34370-44-0 HCAPLUS
CN Phosphoric acid, potassium zirconium(4+) salt (2:2:1) (8CI, 9CI) (CA INDEX NAME)



● K

●1/2 Zr(IV)

CC 78-5 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 67
IT 7320-34-5P, Tetrapotassium diphosphate 7778-53-2P, Tripotassium phosphate 7790-53-6P, Potassium metaphosphate **13565-97-4P**, Zirconium diphosphate (ZrP2O7)
RL: BYP (Byproduct); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
(physicochem. transformations during synthesis of double K-Zr phosphates in a melt of potassium nitrate)
IT **54408-13-8**, Potassium zirconium phosphate (KZrH(PO4)2)
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); RCT (Reactant); FORM (Formation, nonpreparative);

PROC (Process); RACT (Reactant or reagent)
(physicochem. transformations during synthesis of double K-Zr phosphates in a melt of potassium nitrate)

IT 1314-23-4, Zirconium dioxide, reactions 7722-76-1, Ammonium dihydrogen phosphate 7757-79-1, Potassium nitrate, reactions 7783-28-0, Diammonium phosphate **13520-92-8** **19527-82-3**, Potassium zirconium phosphate (KZr2(PO4)3) 20213-65-4, Zirconyl nitrate dihydrate
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(physicochem. transformations during synthesis of double K-Zr phosphates in a melt of potassium nitrate)

IT **34370-44-0P**, Potassium zirconium phosphate (K2Zr(PO4)2)
RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(physicochem. transformations during synthesis of double K-Zr phosphates in a melt of potassium nitrate)

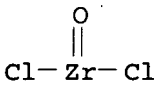
REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 20 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1997:504161 HCAPLUS
DOCUMENT NUMBER: 127:184793
TITLE: Synthesis and structural study of complex alkali metal zirconium phosphates. 2. Potassium zirconium and rubidium zirconium phosphates
AUTHOR(S): Egor'kova, O. V.; Orlova, A. I.; Pet'kov, V. I.; Kemenev, D. V.
CORPORATE SOURCE: Research Institute of Chemistry, Nizhnii Novgorod State University, Nizhnii Novgorod, Russia
SOURCE: Radiochemistry (Moscow)(Translation of Radiokhimiya) (1996), 38(6), 449-451
CODEN: RDIOEO; ISSN: 1066-3622
PUBLISHER: MAIK Nauka/Interperiodica
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Complex Zr orthophosphates MxZr2.25-0.25x(PO4)3 with various ratios of K and Zr and Rb and Zr were prepared Concentration and temperature ranges of the NZP (NaZr2(PO4)3) structure for both groups of phosphates were determined using physicochem. anal. methods (x-ray diffraction anal., IR spectroscopy, and DTA). The influence of preparation methods on crystallog. parameters of phosphates MZr2(PO4)3 (x = 1) was studied. Thermal stability of the compds. was studied as a function of the parameter x.

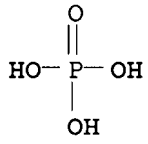
IT **13520-92-8**, Zirconium chloride oxide (ZrCl2O) octahydrate **13772-29-7**, Zirconium phosphate (Zr(HPO4)2)
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of alkali metal zirconium phosphate)

RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



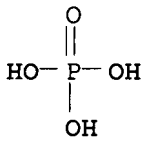
●8 H_2O

RN 13772-29-7 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)



●1/2 Zr(IV)

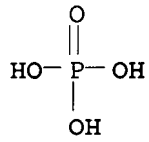
IT **19527-82-3P**, Potassium zirconium phosphate (KZr2(PO4)3)
19527-86-7P, Rubidium zirconium phosphate (RbZr2(PO4)3)
34370-44-0P, Potassium zirconium phosphate (K3Zr1.5(PO4)3)
34370-45-1P 191229-41-1P, Potassium zirconium phosphate (K5Zr(PO4)3) **194015-70-8P**
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation, IR, and crystal structure parameters)
RN 19527-82-3 HCAPLUS
CN Phosphoric acid, potassium zirconium(4+) salt (3:1:2) (8CI, 9CI) (CA INDEX NAME)



●1/3 K

●2/3 Zr(IV)

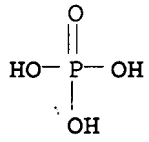
RN 19527-86-7 HCAPLUS
CN Phosphoric acid, rubidium zirconium(4+) salt (3:1:2) (8CI, 9CI) (CA INDEX NAME)



●1/3 Rb

●2/3 Zr(IV)

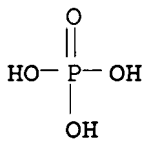
RN 34370-44-0 HCAPLUS
CN Phosphoric acid, potassium zirconium(4+) salt (2:2:1) (8CI, 9CI) (CA INDEX NAME)



● K

●1/2 Zr(IV)

RN 34370-45-1 HCAPLUS
CN Phosphoric acid, rubidium zirconium(4+) salt (2:2:1) (8CI, 9CI) (CA INDEX NAME)

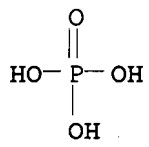


● Rb

●1/2 Zr(IV)

RN 191229-41-1 HCAPLUS
CN Phosphoric acid, potassium zirconium(4+) salt (3:5:1) (9CI) (CA

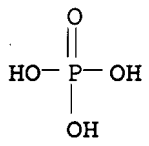
INDEX NAME)



●5/3 K

●1/3 Zr(IV)

RN 194015-70-8 HCAPLUS
CN Phosphoric acid, rubidium zirconium(4+) salt (3:5:1) (9CI) (CA INDEX NAME)



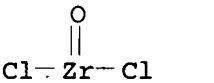
●5/3 Rb

●1/3 Zr(IV)

CC 78-6 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 75
IT 584-08-7, Potassium carbonate (K2CO3) 584-09-8, Rubidium carbonate (Rb2CO3) 1303-86-2, Boron oxide (B2O3), reactions 1314-23-4, Zirconium oxide (ZrO2), reactions 7447-40-7, Potassium chloride (KCl), reactions 7757-79-1, Nitric acid potassium salt, reactions 7791-11-9, Rubidium chloride (RbCl), reactions 13126-12-0 **13520-92-8**, Zirconium chloride oxide (ZrCl2O) octahydrate **13772-29-7**, Zirconium phosphate (Zr(HPO4)2)
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of alkali metal zirconium phosphate)
IT **19527-82-3P**, Potassium zirconium phosphate (KZr2(PO4)3) **19527-86-7P**, Rubidium zirconium phosphate (RbZr2(PO4)3) **34370-44-0P**, Potassium zirconium phosphate (K3Zr1.5(PO4)3) **34370-45-1P 191229-41-1P**, Potassium zirconium phosphate (K5Zr(PO4)3) **194015-70-8P** 194015-73-1P, Potassium zirconium phosphate (K0-5Zr1-2.25(PO4)3) 194015-75-3P, Rubidium zirconium phosphate (Rb0-5Zr1-2.25(PO4)3)
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

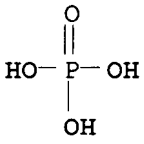
(preparation, IR, and crystal structure parameters)
REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 21 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1997:87595 HCAPLUS
DOCUMENT NUMBER: 126:151959
TITLE: Synthesis, proton conductivity and high-temperature humidity sensing property of Zr(HPO4)2.H2O and its aluminum-substituted compositions
AUTHOR(S): Wang, Ge; Feng, Shou-Hua; Wang, Bo; Greenblatt, Martha
CORPORATE SOURCE: Key Laboratory of Inorganic Hydrothermal Synthesis, Department of Chemistry, Jilin University, Changchun, 130023, Peop. Rep. China
SOURCE: Chemical Research in Chinese Universities (1996), 12(4), 313-321
CODEN: CRCUED; ISSN: 1000-9213
PUBLISHER: Higher Education Press
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Al-containing α-type hydrated zirconium hydrogen phosphates, Zr1-xAlx(H1+x/2PO4)2 with x = 0-0.06, were hydrothermally synthesized and characterized by x-ray diffraction, DTA and TGA. The proton conductivity, 1.2 + 10-4 S cm-1 at 180° was found in Zr0.98Al0.02 (H1.01PO4)2·H2O. Humidity-sensing measurements were carried out at 120° and 140°. Even a limited substitution of Al for Zr can enhance both proton conductivity and humidity sensitivity.
IT **13520-92-8**, Zirconium chloride oxide (ZrCl2O) octahydrate
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of zirconium hydrogen phosphate and its aluminum-substituted compns.)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

IT **13933-56-7P**, Zirconium phosphate (Zr(HPO4)2) monohydrate
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation, proton conductivity and high-temperature humidity sensing property of Zr(HPO4)2.H2O and its Al-substituted compns.)
RN 13933-56-7 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (2:1), monohydrate (8CI, 9CI) (CA INDEX NAME)



●1/2 H_2O

●1/2 Zr(IV)

CC 78-6 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 69, 76
IT 7664-38-2, Phosphoric acid, reactions 7664-39-3, Hydrogen fluoride, reactions **13520-92-8**, Zirconium chloride oxide (ZrCl2O) octahydrate 21645-51-2, Aluminum hydroxide (Al(OH)3), reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(for preparation of zirconium hydrogen phosphate and its aluminum-substituted compns.)
IT **13933-56-7P**, Zirconium phosphate (Zr(HPO4)2) monohydrate 186556-78-5P 186556-80-9P 186556-82-1P 186556-84-3P 186556-86-5P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation, proton conductivity and high-temperature humidity sensing property of Zr(HPO4)2.H2O and its Al-substituted compns.)
REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L59 ANSWER 22 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1996:656596 HCAPLUS
DOCUMENT NUMBER: 125:286053
TITLE: Mesoporous crystalline acid composition of a diphosphonate-phosphite of a tetravalent metal which can be used as a catalyst
INVENTOR(S): Alberti, Giulio; Vivani, Riccardo; Antonini, Vitali Chiara; Zappelli, Piergiorgio; Riocci, Mario
PATENT ASSIGNEE(S): Enricerche S.P.A., Italy
SOURCE: Eur. Pat. Appl., 23 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 736539	A2	19961009	EP 1996-104486	199603

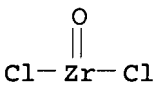
					21
EP 736539		A3	19970402		
EP 736539		B1	20001220		
R: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, LI, LU, MC, NL, PT, SE					
AT 198204		T	20010115	AT 1996-104486	199603 21
ES 2152446		T3	20010201	ES 1996-104486	199603 21
US 5892080		A	19990406	US 1997-942484	199710 02
GR 3035182		T3	20010430	GR 2001-400001	200101 02
PRIORITY APPLN. INFO.:				IT 1995-MI710	A 199504 07
				US 1996-628512	B1 199604 05

AB Described is a solid mesoporous crystalline composition of diphosphonate-phosphite of a tetravalent metal, with a limited distribution of mesopores having the formula M[(O3P-R-PO3)1-x-y(HPO3)2x(O3P-R-PO3H2)2y] wherein: M is a tetravalent metal, R is a bivalent organic radical, x varies from 0.3 to 0.6, yr varies from 0.05 to 0.3. The process for its production is described, together with its uses and a solid catalyst containing -SO3H acid groups, active in the conversion processes of hydrocarbons, which can be obtained from said mesoporous crystalline composition by treatment with a sulfonic-phosphonic or arylphosphonic acid, followed, only in the case of treatment with arylphosphonic acid, by sulfonation with a sulfonating agent.

IT **13520-92-8**
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(mesoporous crystalline acid composition of diphosphonate-phosphite of tetravalent metal for catalyst)

RN 13520-92-8 HCAPLUS

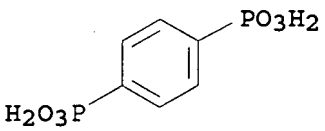
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

IT **141631-76-7DP**, solid solution with zirconium phosphonates
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)
(mesoporous crystalline acid composition of diphosphonate-phosphite of

tetravalent metal for catalyst)
RN 141631-76-7 HCAPLUS
CN Phosphonic acid, 1,4-phenylenebis-, zirconium salt (9CI) (CA INDEX NAME)



●x Zr(x)

IC ICM C07F009-38
ICS B01J029-00; B01J031-00
CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 51, 78
IT 880-68-2, 1,4-Benzenediphosphonic acid 1571-33-1, Phenylphosphonic acid 2310-87-4 4671-77-6, 1,4-Butanediphosphonic acid 4759-28-8, Triphenylmethylphosphonic acid 7526-26-3 7664-39-3, Hydrogen fluoride, reactions 13091-13-9 **13520-92-8** 13598-36-2, Phosphonic acid 57205-76-2 68254-68-2, Zirconyl chloride monohydrate 126180-64-1
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(mesoporous crystalline acid composition of diphosphonate-phosphite of tetravalent metal for catalyst)
IT 71851-97-3DP, solid solution with zirconium phosphonates **141631-76-7DP**, solid solution with zirconium phosphonates
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)
(mesoporous crystalline acid composition of diphosphonate-phosphite of tetravalent metal for catalyst)

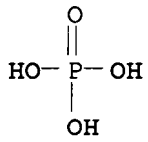
L59 ANSWER 23 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1995:826849 HCAPLUS
DOCUMENT NUMBER: 124:30286
TITLE: Preparative-Scale Separation of Enantiomers Using Intercalated α-Zirconium Phosphate
AUTHOR(S): Garcia, Maurie E.; Naffin, Jacqueline L.; Deng, Nanlin; Mallouk, Thomas E.
CORPORATE SOURCE: Department of Chemistry, Pennsylvania State University, University Park, PA, 16802, USA
SOURCE: Chemistry of Materials (1995), 7(10), 1968-73
CODEN: CMATEX; ISSN: 0897-4756
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 124:30286
AB New lamellar compds. that have potential utility in preparative-scale enantiomeric sepns. were developed by combining principles from solid-state and mol. host-guest chemical Intercalation of α-zirconium phosphate (α-ZrP) by a cationic chiral π-acceptor 3,5-(O2N)2C6H3CO-L-Leu-NHCH2CH2NMe3+.I- produces a

solid that selectively binds one enantiomer of a π-donor analyte 2-C10H7-DL-Ala-OMe from a racemic solution Both crystalline and semicryst. α-ZrP were investigated in order to determine whether crystallinity and particle size have an effect on this process. Under favorable conditions, preparative-scale sepns. can be achieved in a batchwise process by means of multiple passes through the intercalated solid. Even if scaled up for single-pass enantiosepn., these solids provide over 30 times the separation capacity per g relative to brush-type chiral selectors immobilized on chromatog. silica. The intercalated solids were characterized by UV-visible and FT-IR spectroscopies and by powder X-ray diffraction. A dramatic concentration effect is seen in the enantioselective binding; at low concentration of the enantiomer which forms a complex with the intercalated chiral selector there is essentially no binding, while above 150 mM the intercalated chiral host-guest complex is formed almost quant. The structural nature of this concentration dependence is discussed.

IT **13772-29-7D**, intercalated with chiral quaternary ammonium L-leucine derivative; and its charge-transfer complex with Me (S)-N-(2-naphthyl)alaninate
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(preparative-scale separation of enantiomers of Me N-(2-naphthyl)alaninate using intercalated α-zirconium phosphate)

RN 13772-29-7 HCAPLUS

CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)

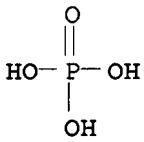


●1/2 Zr(IV)

IT **13933-56-7P**
RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(preparative-scale separation of enantiomers of Me N-(2-naphthyl)alaninate using intercalated α-zirconium phosphate)

RN 13933-56-7 HCAPLUS

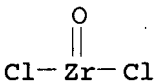
CN Phosphoric acid, zirconium(4+) salt (2:1), monohydrate (8CI, 9CI) (CA INDEX NAME)



●1/2 H_2O

●1/2 Zr(IV)

IT **13520-92-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparative-scale separation of enantiomers of Me N-(2-naphthyl)alaninate using intercalated α-zirconium phosphate)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



●8 H_2O

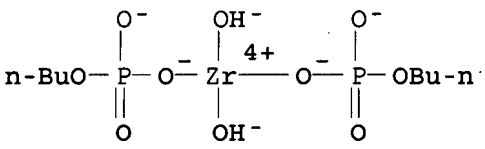
CC 34-2 (Amino Acids, Peptides, and Proteins)
Section cross-reference(s): 66
IT **13772-29-7D**, intercalated with chiral quaternary ammonium L-leucine derivative; and its charge-transfer complex with Me (S)-N-(2-naphthyl)alaninate
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(preparative-scale separation of enantiomers of Me N-(2-naphthyl)alaninate using intercalated α-zirconium phosphate)
IT **13933-56-7P**
RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(preparative-scale separation of enantiomers of Me N-(2-naphthyl)alaninate using intercalated α-zirconium phosphate)
IT 61-90-5, L-Leucine, reactions 91-59-8, 2-Naphthalenamine 99-33-2, 3,5-Dinitrobenzoyl chloride 108-00-9, N,N-Dimethylethylenediamine 5445-17-0, Methyl 2-bromopropionate 7664-38-2, Phosphoric acid, reactions **13520-92-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparative-scale separation of enantiomers of Me N-(2-naphthyl)alaninate using intercalated α-zirconium phosphate)

L59 ANSWER 24 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1990:241802 HCAPLUS
DOCUMENT NUMBER: 112:241802
TITLE: "The third phase" of extraction processes in fuel reprocessing. (I) Formation conditions, compositions and structures of precipitates in zirconium-degradation products of TBP systems
AUTHOR(S): Miyake, Chie; Hirose, Mitsuhiro; Yoshimura, Toshikazu; Ikeda, Masayoshi; Imoto, Shosuke; Sano, Mitsuru
CORPORATE SOURCE: Dep. Nucl. Eng., Osaka Univ., Suita, 565, Japan
SOURCE: Journal of Nuclear Science and Technology (1990), 27(2), 157-66
CODEN: JNSTAX; ISSN: 0022-3131
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Formation conditions, compns. and structures of ppts. or "the third phase" were systematically examined in the systems of Zr and radiation depleted products of TBP, such as HDBP, H2MBP, H3PO4, by means of elemental anal., x-ray diffraction, IR spectra and 1H-NMR. It was confirmed that one of the most important origins for the third phase is a complexation between Zr ion and the depleted products of TBP. When the depleted products co-existed with each other, the copperative effects on the precipitate formation appeared in low acid solns. Precipitate formation depended on the mole ratio of HDBP/Zr. The amount of precipitate reached the maximum at the mole ratio of .apprx.2 and decreased with increasing concentration of HDBP and finally disappeared at .apprx.10. The precipitate formed at the mole ratio of .apprx.2 had the chemical formula, Zr(NO3)2(HDBP)2(OH)2. Ppts. of the Zr-H2MBP system began to appear at the concentration of H2MBP in one order of magnitude smaller than that of HDBP in Zr-HDBP system. The ppts. of Zr-H2MBP system had no NO3 ion and a basic structure of Zr(HMBP)2(OH)2 with an interlayer distance of 16 Å.

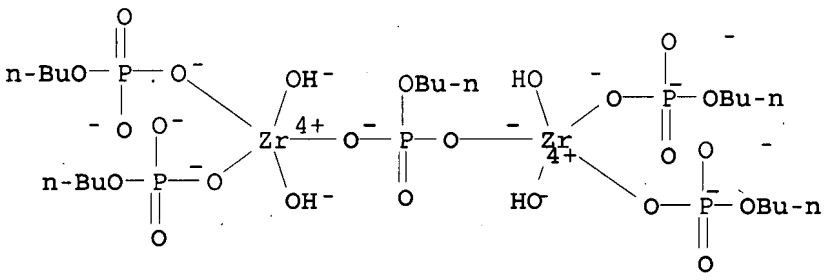
IT **126869-95-2P 126869-96-3P 126870-02-8P 127366-80-7P**
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in third phase of extraction processes in nuclear reactor fuel reprocessing)

RN 126869-95-2 HCAPLUS
CN Zirconate(2-), dihydroxybis[monobutyl phosphato(2-)-O']-, dihydrogen, (T-4)- (9CI) (CA INDEX NAME)



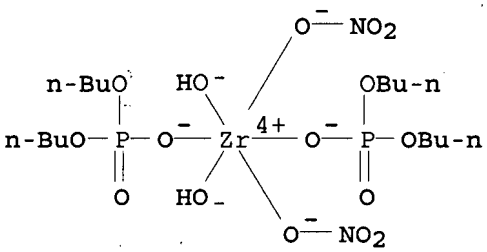
●2 H+

RN 126869-96-3 HCAPLUS
CN Zirconate(6-), tetrahydroxy[μ-[monobutyl phosphato(2-)-O':O'']]tetrakis[monobutyl phosphato(2-)-O']di-, hexahydrogen (9CI) (CA INDEX NAME)



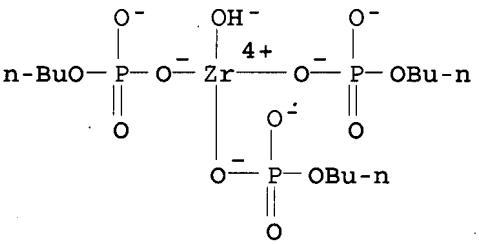
●6 H^+

RN 126870-02-8 HCAPLUS
CN Zirconate(2-), bis(dibutyl phosphato-O'')dihydroxybis(nitrato-O)-, dihydrogen (9CI) (CA INDEX NAME)



●2 H^+

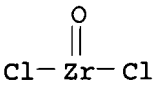
RN 127366-80-7 HCAPLUS
CN Zirconate(3-), hydroxytris[monobutyl phosphato(2-)-O']-, trihydrogen, (T-4)- (9CI) (CA INDEX NAME)



●3 H^+

IT **13520-92-8**
RL: PROC (Process)

(zirconium-degradation products of TBP systems containing, complexation behavior of, third phase of extraction processes in fuel reprocessing in relation to)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)



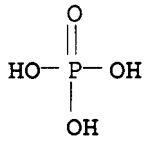
●8 H_2O

CC 71-5 (Nuclear Technology)
IT **126869-95-2P 126869-96-3P 126870-02-8P 127366-80-7P**
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in third phase of extraction processes in nuclear reactor fuel reprocessing)
IT **13520-92-8**
RL: PROC (Process)
(zirconium-degradation products of TBP systems containing, complexation behavior of, third phase of extraction processes in fuel reprocessing in relation to)

L59 ANSWER 25 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1986:544871 HCAPLUS
DOCUMENT NUMBER: 105:144871
TITLE: Derivatives of α-zirconium phosphate with two different functional groups
AUTHOR(S): Alberti, G.; Costantino, U.; Kornyei, J.; Giovagnotti, M. L. Luciani
CORPORATE SOURCE: Dip. Chim., Univ. Perugia, Perugia, 10-06100, Italy
SOURCE: Reactive Polymers, Ion Exchangers, Sorbents (1985), 4(1), 1-10
CODEN: RPISDH; ISSN: 0167-6989
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The preparation of Zr(RPO3)x(RPO3)2-x was achieved by precipitating a mixture of 2 phosphonic acids with a Zr salt in the presence of HF. Zr(HPO4)x(R1PO3)2-x (R1 = H, Ph, CH2CH2CO2H), Zr(RPO3)x(R1PO3)2-x (R = CH2CH2CO2H; R1 = CH2OH), and Zr(HPO3)x(R1PO3)2-x (R1 = Ph, CH2OH, CH2CO2H, CH2CH2CO2H) were prepared and characterized with regard to their compns., x-ray powder patterns and densities. The system is discontinuous, not all x values from 0 to 2 being possible. No single crystals for x-ray structure determination were obtained; however, some chemical evidence shows that the mixed compds. possess a layered structure similar to that of α-Zr phosphate. Some considerations on the reciprocal disposation of the R and R1 pendent groups in the layered structure are reported.
IT **13772-29-7DP**, solid solns. with zirconium phosphonates **69031-88-5DP**, solid solns. with zirconium phosphate or phosphonate **69031-92-1DP**, solid solns. with zirconium phosphonates **73078-09-8DP**, solid solns. with zirconium hydroxymethylphosphonate **75406-99-4DP**, solid solns. with zirconium phosphate or phosphonates

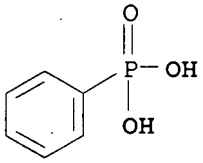
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation and x-ray diffraction by).

RN 13772-29-7 HCAPLUS
CN Phosphoric acid, zirconium(4+) salt (2:1) (8CI, 9CI) (CA INDEX NAME)



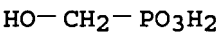
●1/2 Zr(IV)

RN 69031-88-5 HCAPLUS
CN Phosphonic acid, phenyl-, zirconium(4+) salt (2:1) (9CI) (CA INDEX NAME)



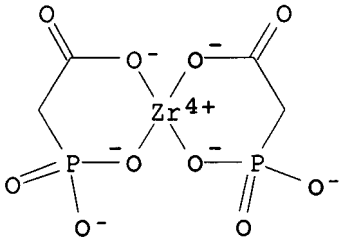
●1/2 Zr(IV)

RN 69031-92-1 HCAPLUS
CN Phosphonic acid, (hydroxymethyl)-, zirconium(4+) salt (2:1) (9CI) (CA INDEX NAME)



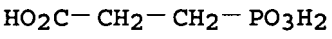
●1/2 Zr(IV)

RN 73078-09-8 HCAPLUS
CN Zirconate(2-), bis[phosphonoacetato(3-)]-, dihydrogen, (T-4)- (9CI) (CA INDEX NAME)



●2 H^+

RN 75406-99-4 HCAPLUS
CN Propanoic acid, 3-phosphono-, zirconium(4+) salt (2:1) (9CI) (CA INDEX NAME)



●1/2 Zr(IV)

IT **13520-92-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactions of, with phosphoric or phosphonic acids in presence of hydrofluoric acid)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)

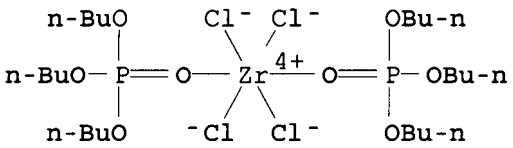
●8 H_2O

CC 78-6 (Inorganic Chemicals and Reactions)
IT **13772-29-7DP**, solid solns. with zirconium phosphonates
28482-76-0DP, solid solns. with zirconium phosphate or phosphonates
69031-88-5DP, solid solns. with zirconium phosphate or phosphonate **69031-92-1DP**, solid solns. with zirconium phosphonates **73078-09-8DP**, solid solns. with zirconium hydroxymethylphosphonate **75406-99-4DP**, solid solns. with zirconium phosphate or phosphonates
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation and x-ray diffraction by)
IT **13520-92-8**
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactions of, with phosphoric or phosphonic acids in presence of hydrofluoric acid)

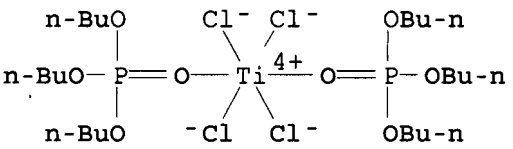
L59 ANSWER 26 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1974:430356 HCAPLUS
DOCUMENT NUMBER: 81:30356
TITLE: Properties of aqueous and nonaqueous solutions of rare elements
AUTHOR(S): Korovin, S. S.; Lebedeva, E. N.; Apraksin, I. A.; Glubokov, Yu. M.; Berezhko, P. G.
CORPORATE SOURCE: USSR
SOURCE: Khim. Khim. Tekhnol., Tr. Yubileinoi Konf., Posvyashch. 70-Letiyu Inst. (Mosk. Inst. Tonkoi Khim. Tekhnol.) (1972), Meeting Date 1970, 301-7. Editor(s): Bashkirov, A. N. Mosk. Inst. Tonkoi Khim. Tekhnol.: Moscow, USSR. CODEN: 28IMAS
DOCUMENT TYPE: Conference
LANGUAGE: Russian

AB The solubility of alkali, alkaline earth, Group IIIA, rare earth and Group IV chlorides (anhydrous and hydrated) in Bu3PO4 was determined in an attempt to establish a correlation between solubility, extraction, and crystal lattice energy. Heats of coordination, dipole moments, and ir spectra (νP:o) are reported for GaCl3.2Bu3PO4, GaCl3.Bu3PO4, and MCl4.nBu3PO4 (n = 1-2) (M = Sn, Ti, Zr, Hf). Solns. of MCl4.nBu3PO4 are a mixture of cis and trans isomers.

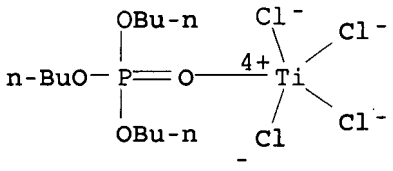
IT **18078-23-4**
RL: PRP (Properties)
(dipole moment and ir spectrum of)
RN 18078-23-4 HCAPLUS
CN Zirconium, tetrachlorobis(tributyl phosphate-O''')- (9CI) (CA INDEX NAME)



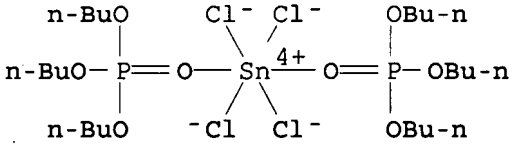
IT **18662-61-8 21858-78-6 23672-11-9 23672-12-0**
RL: PRP (Properties)
(heat of formation and dipole moment of)
RN 18662-61-8 HCAPLUS
CN Titanium, tetrachlorobis(tributyl phosphate-O''')- (9CI) (CA INDEX NAME)



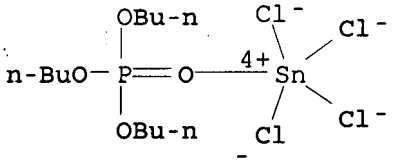
RN 21858-78-6 HCAPLUS
CN Titanium, tetrachloro(tributyl phosphate-O''')- (9CI) (CA INDEX NAME)



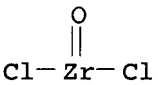
RN 23672-11-9 HCAPLUS
CN Tin, tetrachlorobis(tributyl phosphate-O''')- (9CI) (CA INDEX NAME)



RN 23672-12-0 HCAPLUS
CN Tin, tetrachloro(tributyl phosphate-O''')- (9CI) (CA INDEX NAME)



IT **13520-92-8**
RL: PRP (Properties)
(solubility of, in tributyl phosphate)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)

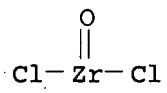


● 8 H_2O

CC 68-1 (Phase Equilibriums, Chemical Equilibriums, and Solutions)
IT **18078-23-4** 40207-36-1 53073-41-9 53238-60-1
RL: PRP (Properties)
(dipole moment and ir spectrum of)
IT **18662-61-8 21858-78-6 23672-11-9**
23672-12-0 53011-90-8
RL: PRP (Properties)
(heat of formation and dipole moment of)
IT 7446-70-0, properties 7447-40-7, properties 7447-41-8,
properties 7647-14-5, properties 7721-01-9 7774-34-7
7784-13-6 7786-30-3, properties 7791-11-9 7791-18-6
10025-70-4 10025-82-8 10026-11-6 10026-12-7 10043-52-4,
properties 10361-37-2 10361-84-9 10476-85-4 13450-90-3

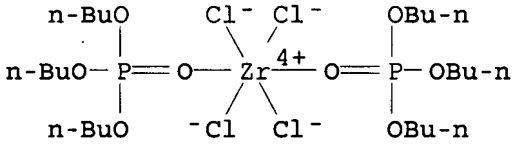
13499-05-3 13520-91-7 **13520-92-8** 14456-34-9
15607-09-7 16712-20-2 52788-96-2 52788-97-3
RL: PRP (Properties)
(solubility of, in tributyl phosphate)

L59 ANSWER 27 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1968:53921 HCAPLUS
DOCUMENT NUMBER: 68:53921
TITLE: Composition of zirconium solvates with tributyl phosphate
AUTHOR(S): Korovin, S. S.; Dubrovskaya, V. V.; Berezhko, P. G.; Apraksin, I. A.
CORPORATE SOURCE: Mosk. Inst. Tonkoi Khim. Tekhnol. im. Lomonosova, Moscow, USSR
SOURCE: Zhurnal Neorganicheskoi Khimii (1967), 12(11), 3128-31
CODEN: ZNOKAQ; ISSN: 0044-457X
DOCUMENT TYPE: Journal
LANGUAGE: Russian
AB The solns. of Zr in Bu3PO4 were obtained by multistage extraction of ZrOCl2.8H2O by Bu3PO4 containing HCl 3.9 moles/l. After 40 min. contact of the 2 phases, the Bu3PO4 extract was separated and replaced by fresh solvent. After 4 operations no more Zr passed into the solvent, which contained then ZrO2 0.78 mole./l., with the Cl-/Zr ratio = 4.02. A part of the HCl contents of the organic phase passed into the aqueous phase, formed from the crystallization H2O of ZrOCl2.8H2O. The saturation of Bu3PO4 with HCl was therefore completed after each operation; the Zr concentration attained then ZrO2 1.58 moles./l. The same maximum concentration which corresponds to a mole ratio of Bu3PO4/Zr = 2 was obtained at the same conditions also in the extraction of ZrOCl2.8H2O with Bu3PO4, saturated with HNO3 and with HCl + CaCl3. The mole ratio Cl-/Zr (or NO-/Zr) was in all these expts. .apprx.4. Thus, the formula of the extracted compound, ZrCl4.2Bu3PO4, or Zr(NO3)4.2Bu3PO4, was established.
IT **13520-92-8**
RL: PROC (Process)
(extraction of, by tributyl phosphate)
RN 13520-92-8 HCAPLUS
CN Zirconium, dichlorooxo-, octahydrate (8CI, 9CI) (CA INDEX NAME)

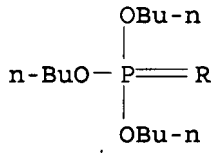


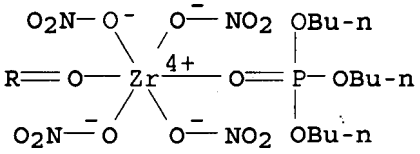
●8 H_2O

IT **18078-23-4P 18078-24-5P**
RL: PREP (Preparation)
(from extraction of zirconyl chloride with tributyl phosphate)
RN 18078-23-4 HCAPLUS
CN Zirconium, tetrachlorobis(tributyl phosphate-O''')- (9CI) (CA INDEX NAME)



RN 18078-24-5 HCAPLUS
CN Zirconium, tetrakis(nitrato-κO)bis(tributyl phosphate-κO''')- (9CI) (CA INDEX NAME)





CC 68 (Phase Equilibriums, Chemical Equilibriums, and Solutions)
IT **13520-92-8** 20213-65-4
RL: PROC (Process)
(extraction of, by tributyl phosphate)
IT **18078-23-4P 18078-24-5P**
RL: PREP (Preparation)
(from extraction of zirconyl chloride with tributyl phosphate)

=>